

V. NEOTROPICAL HOMOPTERA OF THE CARNEGIE
MUSEUM.

PART 5. REPORT UPON THE COLLECTIONS IN THE SUBFAMILY CICA-
DELLINÆ, WITH DESCRIPTIONS OF NEW SPECIES.

(PLATES XI-XVI)

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The *Cicadellinæ* include an immense number of species, many of them strikingly beautiful in color or peculiar in shape, having bizarre forms. While a very fascinating group, they evidently have been the despair of systematists on account of the great multiplicity of species and uncertain relationships. No dependable characters have been found for the separation of genera and the distinction of species, but in many cases the genitalia appear to offer quite reliable characters, especially for the separation of species.

Signoret¹ was the first to attempt a monograph of the group and he included three hundred and ninety-six species, three hundred and eighty-eight of them being given detailed description and many of them figured in colored plates. All were placed in the genus *Tettigonia* (preoccupied in the Orthoptera) but he indicated sub-groups, some of which were later given generic rank by Stål and others.

Of the species treated by Signoret three hundred and twenty are recorded as South American, or Neotropical, Stål added fourteen in his "Rio Hemiptera" (1858) and Fowler treated the group very fully in the *Biologia Centrali-Americana* (1894-1899) describing one hundred and thirty-eight species as new. Breddin and Jacobi also described a number from the Andean Region, so that, with scattering

¹ *Revue Iconographique des Tettigonides*, Ann. Soc. Ent. de France (2) vols. I-III, 1853-1855.

species described by other authors, there are more than five hundred species heretofore recognized from the Neotropical Region. With the species added in the present paper it is evident that we here have a wonderful array of species, showing that this is the richest region of the globe for this division of the Cicadellidæ.

In addition to the material in the Carnegie Museum I have had in hand a considerable number of South and Central American species, including a number of those described by Breddin and Jacobi, representing the type localities, in some cases evidently being specimens from the type lots, secured by purchase from European dealers. This has aided materially in placing many of the species, which were uncertain; and I have taken the occasion to redescribe and figure a number of these to aid students in the further study of this group.

It is evident that there is still a rich harvest awaiting intensive collecting in the less explored parts of the American tropics and a monographic treatment of the group with elucidation of the affinities of the genera must await further collections and a more exhaustive study of its biology and ecology.

It seems quite certain that current works do not represent in any degree the natural affinities or lines of evolution of the various subdivisions of the group, but it seems best for the sake of convenience to follow the prevailing order and I have arranged the genera practically as given by VanDuzee in his *Catalog of Hemiptera North of Mexico* and that given by Fowler in the *Biologia Centrali-Americana* for the genera not included by VanDuzee.

Many of the species occur in enormous numbers as individuals, and, where infesting plants of commercial value, must assume great economic importance. Moreover some of the species are important as possible carriers of plant-diseases, so that a knowledge of the species is of practical as well as biologic interest.

I am indebted to Mr. J. N. Knull for the drawings given in the plates, illustrating details of structure, which will show distinctive characters, where a verbal description would be quite inadequate.

Order **HEMIPTERA** Linnæus.SUBORDER *HOMOPTERA* Latreille.Family **CICADELLIDÆ** (Latreille).SUBFAMILY **CICADELLINÆ** VanDuzee.Genus **DIESTOSTEMMA** Amyot et Serville.

Diestostemma AMYOT et SERVILLE, Hist. Nat. des Ins. Hemipt., 1843, p. 572,
(Genotype *Cicada albipennis* Fabricius).

1. **Diestostemma albipenne** (Fabricius).

Cicada albipennis FABRICIUS, Syst. Rhyng., 1803, p. 62.

Diestostemma albipenne WALKER, List of Homopt. in B. M., Pt. III, 1852, p. 798.

Tettigonia albipennis SIGNORET, Ann. Soc. Ent. Fr. (3) III, 1855, p. 526.

Diestostemma albipennis FOWLER, Biol. Cent.-Amer., Homopt., Vol. II, Dec., 1898,
p. 208.

This species is characterized by the dull yellowish body, snowy white elytra, and the comparatively short prothorax. Length: 18 mm.

Previous records indicate its occurrence in Guatemala, Panama, and South America as far south as Brazil. Specimens in the Carnegie Museum are as follows: Santa Cruz de la Sierra, Bolivia, 450 m., Carn. Mus. Acc. No. 4549 (J. Steinbach *coll.*); Pied Saut, Oyapok River, French Guiana Carn. Mus. Acc. No. 6173 (S. M. Klages *coll.*); Valparaiso, Cacagualito, May, Don Amo, July, Onaca (2500 ft.) Dec., all in the Department of Madgalena, Colombia, Carn. Mus. No. 1999 (H. H. Smith *coll.*); Hyutanahan, Rio Purús, Brazil, Feb., Carn. Mus. Acc. No. 6993 (S. M. Klages *coll.*). There is also a specimen from Cochabamba, Bolivia, in the collection of the author.

2. **Diestostemma nigropunctatum** (Signoret).

Tettigonia nigropunctata SIGNORET, Ann. Soc. Ent. Fr. (3) III, 1855, p. 527.

Diestostemma nigropunctatum FOWLER, Biol. Cent.-Am., Homop., II, p. 208.

This species, described from "Mexico," differs from *D. albipenne* in being slenderer and in the presence of four distinct black dots on the elytra, three of which are near the claval suture, the other near the center of the disk. Length: 18 to 20 mm.

3. **Diestostemma rugicolle** (Signoret).

Tettigonia rugicollis SIGNORET, Ann. Soc. Ent. Fr. (3) III, 1855, p. 525, pl. 21,
fig. 18.

Diestostemma rugicolle FOWLER, Biol. Cent.-Am., Homop., II, p. 208.

This species is characterized by the prothorax being distinctly

rugose on the anterior border with the body yellow and elytra snowy white and bearing four black dots as in *D. nigropunctatum*. Length: 16 mm. without the head appendage.

This species was described from Mexico and Fowler (*l. c.*) records a number of Mexican localities and also Belize, British Honduras. No records appear to have been made from South America.

4. *Diestostemma bituberculatum* (Signoret).

Tettigonia bituberculata SIGNORET, Ann. Ent. Soc. Fr. (3) III, 1855, p. 528, pl. 21, fig. 19.

Signoret described this species as from the Rio Negro and distinguished it from *albipenne* and related forms by the prominent elevations on the pronotum. It is a large species, 20 mm. long. The head and thorax are tinged with brown and the elytra snowy white, with a small black point next the claval suture.

Genus RHAPHIRHINUS Laporte.

Rhaphirhinus LAPORTE, Ann. Soc. Ent. Fr. I, 1832, p. 415.

5. *Rhaphirhinus phosphoreus* (Linnæus).

Fulgora phosphorea LINNÆUS, Syst. Nat. I, 1758, p. 704.

Fulgora phosphorea FABRICIUS, Syst. Rhyng., 1803, p. 2.

Fulgora adscendens FABRICIUS, Mant. Ins. II, 1787, p. 260; Syst. Rhyng., 1803, p. 3.

Tettigonia phosphorea SIGNORET, Ann. Soc. Ent. Fr. (3) III, 1855, p. 522.

Cicada filirostris DEGEER, Mémoires, III, 1773, p. 201.

Rhaphidorhinus phosphoreus STÅL, Hemip. Fabr., II, 1869, p. 62.

Head as wide as pronotum, triangularly produced; vertex nearly twice as long at middle as between the eyes, with a narrow median furrow, and with a long curved ascendent spine the length of the vertex; front flattened on the disk; clypeus swollen, angularly contracted at tip. Pronotum slightly widened behind; anterior border broadly rounded; hind border marginate at center; disk densely punctate. *Genitalia: female*, last ventral segment produced at the middle with a short tooth on each side; *male*, plates narrow, sunken between margins of pygofer, narrowing to acute tips which extend to the tip of pygofer.

Yellowish; vertex black with yellow borders; pronotum yellowish, with dark punctures and a central fuscous stripe; scutellum with polished brown basal angles, darker central disk; elytra purplish-brown, minutely dotted with greenish yellow. Beneath dull yellow, with lines of fuscous across front and bordering the thorax; abdomen above brown, bordered with yellow; beneath, light yellow; legs light yellow; hind tibiæ dotted with black; tips of the tibiæ, the tarsi, and

tarsal joints, fuscous. Length: female 15 mm. without spine; male 13 mm.

Cayenne, French Guiana, Carn. Mus. Acc. No. 5873 (Klages *coll.*). Specimens in my collection from Bartica, British Guiana, June and July, 1901.

6. *Rhaphirhinus fasciatus* Fabricius.

Fulgora fasciata FABRICIUS, Mant. Ins., II, 1787, p. 261; Syst. Rhyng., 1803, p. 4.

Rhaphirhinus obliquatus LAPORTE, Ann. Soc. Ent. Fr., I, 1832, p. 415.

Tettigonia fasciata BURMEISTER, Ent., II, 1835, p. 120.

Tettigonia fabricii SIGNORET, Ann. Soc. Ent. Fr. (3) III, 1855, p. 521.

Rhaphidorhinus fasciatus STÅL, Hemiptera Fabriciana II, 1869, p. 262.

Similar to *R. phosphoreus*, but differing distinctly in the presence of four yellow bands on the elytra, the first two oblique, the hinder ones straight.

Santarem, Brazil, July 19, Carn. Mus. Acc. No. 6324 (Klages *coll.*). The Fabrician record was from Cayenne, and Signoret records it from Brazil.

Genus ACROCAMPSA Stål.

Acrocampsia STÅL, Hemip. Fabr., II, 1869, p. 66.

7. *Acrocampsia pallipes* (Fabricius).

Fulgora pallipes FABRICIUS, Mant. Ins., II, 1787, p. 261.

Cicada rutilans FABRICIUS, Syst. Rhyng., 1803, p. 64.

Cicada pallipes FABRICIUS, Syst. Rhyng., 1803, p. 66.

Tettigonia rutilans SIGNORET, Ann. Ent. Soc. Fr. (3) III, 1855, p. 511, pl. 21, fig. 6.

Acrocampsia pallipes STÅL, Hemip. Fabr., II, 1869, p. 66.

Slender; head elongate, triangular; eyes protruding; vertex longer than width between the eyes, deeply furrowed on the disk; apex upturned; front narrow, concave; clypeus gibbous, contracted toward tip. Pronotum quadrate, coarsely punctulate and rugose; fore tibiæ flattened and expanded toward apex; posterior angles a little elevated. *Genitalia: female*, last ventral segment one-half longer than preceding, the disk with converging ridges; hind border nearly truncate; *male*, last ventral segment longer than preceding; plates elongate, triangular; tips somewhat acuminate, compressed, upturned.

Dark olive-green tinged with brownish; vertex somewhat infusate. Pronotum, scutellum, and base of vertex tinged with yellowish; face dark brown; pectus yellow. Abdomen above orange and yellow, with margins of segments more or less infusate; beneath yellow; apex of female plate black; legs with apex of tibiæ and the tarsi dusky. Length: 12 mm.

Specimens from Benevides, Pará, Brazil, Oct. 1918, Carn. Mus. Acc. No. 6174 (S. M. Klages *coll.*).

The species was originally described from Cayenne and my collection includes specimens from Bartica, British Guiana. Stål includes it in his Hemiptera from Rio de Janeiro. It is evidently distributed over a considerable part of northern South America.

Genus DICHROPHLEPS Stål.

Dichrophleps STÅL, Hemipt. Fabric., II, 1869, p. 62.

8. *Dichrophleps aurea* (Fabricius).

Cicada aurea FABRICIUS, Syst. Rhyng., 1803, p. 63.

Tettigonia aurea SIGNORET, Ann. Soc. Ent. Fr. (3) III, 1855, p. 510, pl. 12, fig. 15.

Dichrophleps aurea STÅL, Hemipt. Fabric., II, 1869, p. 63.

Head large; eyes protuberant; vertex somewhat flattened, rounded to front; ocelli in line with anterior border of the eyes, twice as far from each other as from the eye; front tumid, somewhat flattened and glaucous on the disk; clypeus swollen at base, tip contracted. Pronotum strongly rugose, narrowed posteriorly; hind border deeply concave; scutellum long, acuminate; elytra long, narrow. *Genitalia: male*, plates small, elongate, triangular, about one-fourth as long as pygofer.

Dull yellowish; vertex brownish fuscous; lower part of front polished black. Pronotum brown with oval yellowish spots, two of which are on the middle and form a broken line with the median line of vertex; scutellum with basal angles and a broken band toward the apex, yellowish; elytra yellowish hyaline; the costa and the veins black; abdomen yellowish; legs dull brownish; apex of tibiæ and the tarsi darker. Length: 15 mm.

Specimens from Pied Saut, French Guiana, Carn. Mus. Acc. No. 6111 (Klages *coll.*). Three males from Bartica, British Guiana, collected April, May, and August, 1901, by H. S. Parish.

Genus PROPETES Walker.

Propetes WALKER, List Homopt. B. M., 1851, p. 797. (Genotype *Propetes compressa* Walker.)

9. *Propetes nigra* (Signoret).

Tettigonia nigra SIGNORET, Ann. Soc. Ent. Fr. (3) III, 1855, p. 513.

Short and broad, hairy; head vertical, front furrowed; eyes conspicuous, scarcely wider than pronotum; elytra hyaline, much longer

than the short broad flattened abdomen. The male plates are small, triangular, and thick.

Black, abdomen with a yellow narrow transverse band at base and partial band near tip, the underside yellow at base and with narrow yellow margins to the segments. Length: 10 mm.

Specimens from Chapada, Brazil, Jan., Carn. Mus. Acc. No. 2966 (H. H. Smith *coll.*). These specimens have the bars of elytra very faint, but otherwise agree with Signoret's description and figure. They have a distinct resemblance to certain bees and I think deserve generic rank along with *P. compressa* Walker, the type species, and *P. limpida* Signoret, with possibly other species of the tropics.

Genus ZYZZA Kirkaldy.

Zyzza, The Entomologist, XXXIII, 1900, p. 243. (Genotype *Tettigonia cucullata* Laporte = *Tettigonia marmorata* Fabricius.)

10. *Zyzza marmorata* (Fabricius).

Tettigonia marmorata FABRICIUS, Syst. Rhyng., 1803, p. 61.

Tettigonia cristata FABRICIUS, l. c., p. 62.

Tettigonia cucullata LAPORTE, Ann. Soc. Ent. Fr., I, 1832, p. 223, pl. 6, fig. 3.—

WALKER, List Homopt. B. M., Pt. III, 1851, p. 782.

Germaria cristata AMYOT et SERVILLE, Hist. Nat. des Ins. Hemipt., 1843, p. 571.—

WALKER, List of Homopt. B. M., Pt. III, 1851, p. 782.

Germaria marmorata STÅL, Hemipt. Fabric., II, 1869, p. 59.

The typical form of this species is black above, with orange spots on the vertex, numerous spots on the pronotum, apical part of scutellum and a large part of the elytra with orange spots, the latter elongate and enclosed within the cells, or separated by the veins. Beneath black, lateral portions of the thorax dull yellowish, abdomen black, largely covered with pruinosity. Legs black. The crest of the pronotum not extended forward.

Genitalia: male, valve very short, plates broad at base, narrowing beyond the middle to slender acuminate up-turned tips, extending to the tip of pygofer. Length 17 mm.

The variety B. of Signoret is black, with faint indications of the elytral spots in brown, but no spots on the head or pronotum, the crest produced slightly forward; the male plates less acuminate and shorter, scarcely reaching the end of pygofer. Length: 17.5 mm.

The variety *cristata* is uniformly brown, without traces of the orange spots, and lacking the pruinosity of the underside. *Genitalia: female*, last ventral segment concave behind, the margin thickened, pygofer short, slightly exceeded by the ovipositor. Length: 18 mm.

The typical form is from Hyutanahan, Purús River, Brazil, April,

1912. Variety *B.* and *Z. cristata* both from Mana River, French Guiana, July, 1917, Carn. Mus. Acc. No. 6008 (S. M. Klages coll.).

The species appears to be generally distributed in northern South America, extending southward to Brazil, and the different varieties occur together.

Signoret remarks that all specimens of his variety *A.* are females, while all of his variety *C.* are males; but I have a female specimen from Chanchamayo, as well as a specimen from the Mana River, a female, which fall into variety *C.*

The Carnegie Museum possesses a specimen from Provincia del Sara, Bolivia (Steinbach coll.). One specimen from Yungas, Bolivia, and one from Callanga, Peru, males, of the typical variety are contained in the author's collection.

Genus COLEOPOLA Stål.

Coleopola STÅL, Hemipt. Fabric., II, 1869, p. 65. (Genotype *Cicada adspersa* Fabricius.)

11. *Coleopola adspersa* (Fabricius).

Cicada adspersa FABRICIUS, Syst. Rhyng., 1803, p. 61.

Tettigonia adspersa BURMEISTER, Handb. Ent. II, 1, 1835, p. 119.—BLANCHARD, Hist. Nat. des Ins., III, 1840-1841, p. 192, pl. IV, fig. 6.—SIGNORET, Ann. Soc. Ent. Fr. (3) III, 1855, p. 767, pl. 23, fig. 2.

Ciccus adspersa AMYOT et SERVILLE, Hist. Nat. des Ins. Hemipt., 1843, p. 572.—WALKER, List Homopt. B. M., 1851, p. 799.

Ciccus obliquus WALKER, l. c., p. 800.

Coleopola adspersa STÅL, Hemipt. Fabric., 1869, p. 65.

The general color is fulvous, the pronotum, scutellum, and clypeus brown, the latter with numerous small ivory-yellow dots, the tip of the abdomen black. Length: 17 mm.

Two specimens are in the author's collection from Bartica, British Guiana, collected by H. S. Parish, April 18 and June 29, 1901.

12. *Coleopola atomaria* (Walker).

Aulacizes atomaria WALKER, List Homopt. B. M., III, 1851, p. 792.

Slenderer than *adspersa*, but somewhat similar in markings, the dots on the elytra so arranged as to form three irregular bands between scutellum and apex, and with a small basal area and the apical part of the elytra free from spots. The pronotum is transversely furrowed and striate with transverse dots; the central part of the scutellum is irregularly dotted with yellow; beneath greenish, the hind border of the segments brownish, the central apical part of the

last ventral segment black; the last ventral segment of the female produced and a bifid polished tooth at the center. Length: 17 mm.

A specimen from Mana River, French Guiana, May 1917, Carn. Mus. Acc. No. 6008 (S. M. Klages *coll.*). There is also a specimen in the author's collection from Bartica, British Guiana, collected April 1, 1901, by H. S. Parish. One specimen, apparently teneral, male, from Santarem, June, 1919, Carn. Mus. Acc. No. 6324 (S. M. Klages *coll.*).

Genus AMBLYDISCA Stål.

Amblydisca STÅL, Hemipt. Fabric., II, 1869, p. 61. (Genotype *Tettigonia rubriventris* Signoret, Ann. Soc. Ent. Fr. (3) III, 1855, p. 52.)

This genus is characterized by having the pronotum narrowed in front, the vertex distinctly impressed, and the scutellum flat, or somewhat depressed; the front flat or slightly concave; the clypeus produced, forming a sharp right-angled carina, the lower part nearly in line with the rostrum.

13. *Amblydisca irregularis* (Signoret).

Tettigonia irregularis SIGNORET, Ann. Soc. Ent. Fr. (3) III, 1855, p. 232.

This species is dull brown; the head is somewhat lighter or dull yellowish; the surface of pronotum and elytra irregularly reticulate, many of the depressions including pruinose spots; beneath dull brown, the legs somewhat darker. *Genitalia: female*, last ventral segment rugose, about twice as long as preceding, the hind border sharply irregular, somewhat emarginate; a small polished tooth at the center; *male*, last segment carinate, margins raised, posterior margin deeply incised, the lobes rounded. Length: female, 17 mm.; male, 20 mm.

There is a specimen in the Carnegie Museum from Provincia del Sara, Bolivia, Carn. Mus. Acc. No. 5064 (Steinbach *coll.*). I have also in my collection a specimen from Yungas de La Paz, Bolivia, 1000 m., and two specimens, male and female, from Chanchamayo, Peru.

14. *Amblydisca sulcicollis* Germar.

Tettigonia sulcicollis GERMAR, Mag. d. Ent. IV, 1821, p. 62, pl. 6, fig. 10.—SIGNORET, Ann. Soc. Ent. Fr. (3) III, 1855, p. 56, pl. 6, fig. 10.

Genitalia: female, last ventral segment about as long as the preceding, the hind border thick, somewhat produced, and bluntly toothed at the middle; *male*, last ventral segment broad, strongly carinate at the sides, hind border sinuate, notches at the middle. Length: female, 18 mm.; male, 18 mm. In the female the ovipositor

extends slightly beyond tip of elytra and the elytra are shorter than in the male.

Dull brown; the face fulvous; pronotum rather deeply sulcate, and darker brown on the front border; elytra with the veins elevated and the costal portion rather densely punctate and lighter in color. Beneath brown, tibiæ and tarsi darker.

In the Carnegie Museum from Minas Geraes, Brazil (Haseman *coll.*, 1908). Two specimens, male and female, in the author's collection from Marcapata, Peru.

15. **Amblydisca cinerea** sp. nov. Pl. XI, figs. 5, 5a, 5b.

Slender, parallel; head broader than pronotum; eyes prominent; vertex short, a little longer at middle than next eye, slightly concave before; ocelli elevated; front flattened, punctate on the disk, striate at the sides; clypeus compressed, angularly elevated, but not right-angled, contracted at tip. Pronotum narrowed behind, twice as long as vertex; hind border rather deeply concave, distinctly punctate; scutellum nearly smooth, faintly punctate on the disk; elytra distinctly punctate, except toward apex. *Genitalia: female*, last ventral segment half longer than preceding; hind border slightly concave; *male*, last ventral segment as long as preceding; plates narrowing to near the middle, then extending as nearly parallel strap-like appendages, with rounded apex, slightly longer than pygofer.

Light brownish gray, faintly pruinose, giving it an ashy appearance; vertex and front a little yellowish, marmorate with fuscous. Pronotum with some small maculations on the anterior border and the punctures, fuscous; scutellum with a basal triangle, blackish. Abdomen above brown, borders yellowish; beneath yellowish-gray, pruinose. Length: 10 mm.

Described from two specimens, female (type), male (allotype), taken February and March at Hyutanahan, Rio Purús, Brazil by S. M. Klages (C. M., Acc. No. 6963).

This species has somewhat the appearance of *T. pruinosa* Walker, but is slenderer and differs in the structural details of clypeus and genitalia, the clypeus being less angulate than in typical species of *Amblydisca*. The species seems to fit better in this genus than in any other.

Genus AULACIZES Amyot et Serville.

Aulacizes AMYOT et SERVILLE, Hist. Nat. des Ins. Hemipt., 1843, p. 571. (Haplo-type *Tettigonia quadripunctata* Germar.)

16. **Aulacizes bigibbosa** (Signoret).

Tettigonia bigibbosa SIGNORET, Ann. Soc. Ent. Fr. (3) III, 1855, p. 510, pl. 21, fig. 5.

This very striking species is distinguished by the large disk-like

expansions of the fore tibiæ and the large punctured elevations of the hinder part of the pronotum. The head, pronotum, and scutellum are brown, tinged with fuscous; the elytra olive-green, apical cells blackish with tip and outer part of apical veins pale. Beneath, pectus whitish, venter yellow, disk of fore tibiæ, tips of middle and hind tibiæ, and tarsal claws infusate. Length: 15 mm.

One specimen from Tonantins, Amazonas, Brazil (S. Klages coll.). Signoret's figure is so distinctive, that I feel no hesitation in placing the specimen in this species. The inflated tibia is probably a good generic character, and will no doubt be used, when other species are better known, to form a separate genus, but in other respects the species seems to fall most nearly in *Aulacizes*.

17. *Aulacizes sculptilis* sp. nov. Pl. XI, fig. 2.

Head produced before the eyes, scarcely as wide as pronotum, vertex depressed on the disk, with a shallow median line, a short carina outside the ocellus and two short curved carinæ extending forward on the margin before the eye, front swollen, flattened or faintly concave on the disk; clypeus slightly swollen at base, contracted at tip. Pronotum anteriorly depressed, rugose, nearly twice as long as vertex, hind border faintly concave. Elytra broad, sides parallel, apex broadly rounded and subtruncate. *Genitalia: female*, last ventral segment deeply and broadly notched at sides, the lateral lobes narrow and much longer than the median broad lobe (See Pl. XI, fig. 2).

Head, pronotum, and most of the underside dull yellow, scutellum and elytra purplish margined at tip with brown and with a submargin of fuscous. Length: female 13 mm.

One specimen (type) from Yungas de la Paz, Bolivia, 1000 m., in the author's collection. It differs from *A. dufouri* and *A. amblardi* in lacking the dark hind margin of pronotum, the larger size, and especially in the remarkable sculpture of the last ventral segment.

18. *Aulacizes dufouri* Signoret. Pl. XI, figs. 3, 3a.

Tettigonia dufourii SIGNORET, Ann. Soc. Ent. Fr. (3) III, 1855, p. 55, pl. 6, fig. 8.

Head as wide as pronotum; eyes prominent; vertex and front very much produced; two or three strong ridges before the eyes and the lower one overhanging antennæ; front depressed along middle; clypeus swollen at base, narrowed and rounded at tip. Pronotum broad, coarsely striate; anterior part rugose; hind border faintly sinuate. *Genitalia: female*, last ventral segment nearly twice as long as preceding, with strong carina about half-way from middle to border, which extends into a broad obtuse tooth, on each side of which

the segment is excavated, the lateral border being short; *male*, with a short valve and swollen triangular plates, extending to or beyond t.p of pygofer; the borders densely pilose.

Light yellow; the vertex with a narrow brown stripe including the ocelli. Pronotum with a transverse row and the hind border brown; scutellum brown; elytra brown, with the veins tinged with yellow; abdomen deep red; clypeus red-brown; legs light yellow; tips of tibiæ and the tarsi somewhat dusky. Length: 12 mm.

Provincia del Sara, Bolivia, 450 m., Carn. Mus. Acc. No. 5064 (Steinbach *coll.*)

19. ***Aulacizes amblardi*** Signoret. Pl. XI, figs. 4, 4a.

Tettigonia amblardii SIGNORET, Ann. Soc. Ent. Fr. (3) III, 1855, p. 53, pl. 6, fig. 7.

Head broad, as wide as pronotum, anteriorly produced, distinct ridge above antennæ; front tumid, depressed on the disk; clypeus tumid, carinate toward apex; prothorax one-half longer than vertex, furrowed in front, hind border sinuate; elytra broad; apex oblique, truncate. *Genitalia: male*, plates very broad at base, triangular; outer margin somewhat curved; tips acute, upturned, reaching nearly to tip of pygofer.

Yellow; anterior furrow and hind border of pronotum brown; scutellum and base of elytra reddish-brown; elytra mostly brownish, more or less banded. Beneath yellowish; lower part of face including apex of front, all of clypeus and loræ, black. Length: 11 to 12 mm.

Provincia del Sara, Bolivia, Carn. Mus. Acc. No. 5064 (Steinbach *coll.*).

20. ***Aulacizes intersecta*** (Germar).

Tettigonia intersecta GERMAR, Mag. der Entom., IV, 1821, p. 60.

Tettigonia intersecta SIGNORET, Ann. Soc. Ent. Fr. (3) III, 1855, p. 229, pl. 12, fig. 4.

Head triangular, obtusely angulate; vertex depressed; front excavated; clypeus angularly elevated, contracted at tip. Pronotum strongly rugose before, striate behind, half longer than vertex; elytra parallel. *Genitalia: female*, last ventral segment half longer than preceding hind border produced, forming three blunt angles; ovipositor extruded, slightly passing tip of elytra.

Bluish green; a broken band across vertex, oblique stripe at sides of front; apex of front and all of clypeus, pectus and a median line widening on hind border of pronotum, all of scutellum and about three oblique broken bands across elytra, black; apex of elytra deeply fuscous. Abdominal segments margined with blackish. Length: female, 16 mm.; male, 15 mm.

From Puerto Suarez, Bolivia, 150 m. (Steinbach *coll.*). Previous records are "S. Paulo, Brazil" and "Brazil," so the present record apparently extends its distribution farther west.

21. *Aulacizes delicata* sp. nov. Pl. XI, figs. 1, 1a, 1b.

Head elongate, triangular; tip blunt; vertex depressed, slightly upturned toward apex; front long, tumid, slightly flattened on the disk; clypeus tumid at base, subcarinate; tip rounded. Pronotum with sides parallel; anterior border broad, rounded; hind border slightly concave; elytra parallel, extending beyond tip of abdomen. *Genitalia: male*, last ventral segment as long as preceding; plates divergent at base, narrow; tips compressed; sides of pygofer bearing two long fusiform lobes extending half-way to tip, and running parallel with the plates.

Pale yellow; pronotum and elytra and hind borders of abdominal segments suffused with reddish-brown; vertex with a central blackish line, some fuscous mottlings near the border, a black line at tip, connecting with a fuscous streak bordering the base of front and merging into a blackish spot near the eye. Pronotum yellowish on the anterior border with a darker brown central line; tips of pygofer suffused with orange. Length: 12 mm.

One specimen, male (type) from Minca, Colombia, June, Carn. Mus. Acc. No. 1999 (H.H. Smith *coll.*).

This species has a peculiarly delicate appearance, the body almost transparent, possibly teneral, although the coloration seems to be fully developed.

22. *Aulacizes olivacea* sp. nov. Pl. XI, figs. 7, 7a.

Head elongate, triangular, blunt at tip; vertex slightly depressed; front elongate, somewhat flattened on the disk; clypeus elevated, carinate; apex contracted. Pronotum quadrate; the anterior border broadly arched; lateral borders nearly parallel; hind border angularly emarginate; elytra parallel, extending beyond tip of abdomen. *Genitalia: male*, plates very broad, separated at base, widened toward tips; apex broadly rounded, reaching half way to tip of pygofer.

Above dark olive-green. Beneath light yellow; scutellum with blackish triangles at base; clypeus with a black central line, sometimes extended onto tip of front. Abdomen blackish above, margined with yellowish. Length: male, 11 mm.

Eight specimens, male (type) Villa Braga, Brazil, Dec., 1919, Carn. Mus. Acc. No. 6544, and (paratypes) Santarem, April, May, June, and July, 1919, Carn. Mus. Acc. No. 6324 (S. M. Klages *coll.*).

23. *Aulacizes gracilis* sp. nov. Pl. XI, figs. 9, 9a.

Head elongate, triangular; tip of vertex slightly upturned; front long, faintly flattened on the disk; clypeus long, sub-carinate, slightly swollen to base. Pronotum with sides parallel; anterior border broadly

arched; hind border deeply, angularly emarginate; elytra with veins prominent; inner cell of clavus with cross-nervures. *Genitalia: male*, plates broad, overlapping on inner margins, divergent at tips; hind border broadly rounded, reaching half-way to tip of pygofer.

Pale yellow below, mixed yellow-black, and with brown above; vertex black with numerous irregular yellow spots. Pronotum with anterior part yellow, heavily marked with black; disk dark brown mottled with greenish; scutellum black, spotted with yellow; elytra purplish brown; a considerable part of the disk and apex subhyaline; veins greenish; abdomen black above, margined with yellow; the reticulations and tip of pygofer, tinged with red. Length: 11 mm.

Cacagualito, Colombia, May 19, Carn. Mus. Acc. No. 1999 (H. H. Smith *coll.*).

24. ***Aulacizes marginula*** sp. nov. Pl. XI, figs. 8, 8a.

Slender, head slightly wider than pronotum; vertex produced, rounded in front, slightly depressed; front swollen, slightly flattened on the disk; clypeus swollen at base, contracted at tip; pronotum as long as vertex, widening slightly behind; elytra long, nearly parallel. *Genitalia: male*, valve hidden, plates very short, contracted abruptly at base and extending as very slender tips half the length of the pygofer.

Rich chocolate-brown, the margin of elytra golden yellow, with a conspicuous sulphur-yellow spot toward the tip; a semi-transparent area with yellow border near apex, and apex smoky hyaline; beneath yellow, face tinged with orange; legs pale yellowish white. Length: 9 mm.

Described from one specimen, Las Juntas, Bolivia, Dec. 1913, Carn. Mus. Acc. No. 5066 (Steinbach *coll.*).

25. ***Aulacizes splendidula*** sp. nov. Pl. XI, figs. 10, 10a.

Head rather short for the genus, narrower than pronotum; vertex broad, transversely depressed on the base, and anteriorly on middle, with an elevated carina at apex; ocelli close to the hind border; front flattened on the disk, striate at the sides; clypeus elevated at base, contracted and carinate at tip; pronotum broad, strongly arched in front; lateral border long, carinate; hind border slightly concave; scutellum transversely depressed behind the middle with an acute spine at tip; elytra with irregular reticulate venation; claval veins joined by three or four cross-veins. *Genitalia: female*, last ventral segment elongate; hind border produced, rounded, faintly sinuate at the middle, the disk elevated along the middle; pygofer short, tapering; *male*, valve short, transverse; plates elongate, tapering nearly uniformly from base to acute slightly upturned tips; the disk at base somewhat rugose; pygofers exceeding plates, compressed, setose at tip.

Rich reddish brown; the vertex with a double median yellow stripe. Pronotum with yellow reticulations in front; three orange stripes on the disk, bordered with fuscous, the central one extending nearly to the anterior border; scutellum with the angles and two divergent median bands yellow; elytra with veins broadly orange, giving a very conspicuous, reticulate appearance on the reddish-brown ground. Beneath reddish brown, the lateral part of abdominal segments more or less fuscous and the legs somewhat infuscated. Length: 13.5 mm. to tip of elytra.

Four specimens, one female (type) and three males (allotype and paratypes) Incachaca, Bolivia, Alt. 2500 m., Carn. Mus. Acc. No. 6873 (J. Steinbach coll.).

This species is apparently somewhat similar to *T. similata* Signoret, which I have not seen, but it differs from the description in some structural details, as well as in being much darker colored below.

Genus ONCOMETOPIA Stål.

Oncometopia STÅL, Hemipt. Fabric., II, 1869, pp. 60-62. (Logotype *Cicada undata* Fabricius, Syst. Rhyng., 1803, p. 62.)

26. *Oncometopia ocellata* sp. nov. Pl. XII, figs. 11, 11a.

Slender; head large, much wider than pronotum; vertex produced, rounded, about as long as width between ocelli; ocelli on conspicuous elevations in the transverse furrow; front tumid; clypeus a little swollen at base, narrowed at tip; pronotum strongly arched in front, narrowed toward hind border, with a distinct furrow behind the anterior edge; rather coarse transverse striæ and punctures on the disk; scutellum minutely punctate; elytra with series of punctures along the veins and minute transverse striæ in the areoles. *Genitalia: female*, last ventral segment elongate, with a median carina; lateral angles produced into broad lobes.

Dull yellowish, with irregular stripes on vertex; pronotum, scutellum, and ocelli, black; the front with three parallel stripes, the median one expanding to merge with the others at the apex of front; clypeus and loræ and lower part of face, black; elytra rose-red, with the veins bluish on the disk, fuscous toward the tip; apex smoky hyaline; wings milky hyaline; beneath black; abdomen black above with yellowish border; legs with coxæ, femora, and tarsi mostly black; outer part of femora and the tibiæ mostly reddish-brown. Length: female, 8 to 8.5 mm.

Described from two females, one (type) Provincia del Sara, Bolivia, December, 1912, Carn. Mus. Acc. No. 5064, Steinbach coll., and one (paratype) Provincia del Sara, Bolivia, 450 m., Carn. Mus. Acc. No. 6443 (J. Steinbach coll.).

The bright black ocelli standing on the little yellowish eminences are a conspicuous feature.

27. **Oncometopia marginula** sp. nov. Pl. XII, figs. 12, 12a.

Head broad, eyes conspicuous; vertex produced, sub-angulate; front swollen, somewhat flattened on the disc; clypeus swollen at base, narrowed at tip; pronotum as long as vertex, sides impressed; disk rugose; elytra narrow, margins parallel. *Genitalia: male*, valve hidden, plates small, elongate triangular, two-thirds as long as pygofer.

Brownish fuscous, maculate with yellow on vertex and pronotum, and base of scutellum, tip of scutellum yellow; elytra purplish red, tip smoky hyaline; beneath brownish fuscous, face with irregular spots, and arcs yellowish, pleuræ and margin of abdomen yellow; the venter brown, a lateral stripe margined with yellow, brown, last two ventral segments with a pair of yellow spots. Length: 10 mm.

Described from three specimens, (type and paratypes) from Bahia, Brazil, Dec. 5, 1907, Carn. Mus. Acc. No. 3702 (J. D. Haseman coll.).

28. **Oncometopia minor** sp. nov. Pl. XII, figs. 13, 13a.

Short, thick; head wider than pronotum, produced, rounded to front; vertex twice as long at middle as next the eye; ocelli on elevated disks in a transverse furrow; front tumid; disk somewhat flattened; clypeus elongate, narrowed toward tip, subcarinate; pronotum broad, a distinct furrow bordering the anterior margin, a callous behind each eye; the disk transversely striate and punctate; scutellum and elytra minutely punctate. *Genitalia: female*, last ventral segment half longer than preceding, deeply incised at middle and with an elevated callous patch each side of incision; *male*, plates wide at base, abruptly narrowing to before the middle and extended as narrow divergent upturned, blunt appendages reaching nearly to tip of pygofer.

Dull brown, suffused with dark red; vertex dull yellowish-brown at the middle with blackish lunate lines before ocelli, extending upon the front as lateral arcs; space between ocellus and eye, also the clypeus and border of pronotum behind the eye, orange; pronotum dull gray-brown with anterior furrow black, and a median broken line dark fuscous; scutellum black; the middle of face and an interrupted marginal line each side, orange-yellow; elytra gray-brown suffused with reddish-purple; wings milky hyaline; abdomen above blackish, the sides orange with base of segments black; beneath gray-brown; abdominal segments orange, margined with black; the last ventral segment of female with the lateral callous black; male plates brownish, with fuscous patches at base; legs gray-brown; the femora with fuscous spots and lines, and the tibiæ and tarsi more or less infuscate. Length: female, 7 mm.; male, 6 mm.

One female (type) Chapada, Brazil, April, Carn. Mus. Acc. No. 2966;

one female (paratype) and one male (allotype) Asuncion, Paraguay, July, Carn. Mus. Acc. No. 2966 (H. H. Smith *coll.*).

This species has somewhat the aspect of *O. lateralis*, but is considerably smaller and the color-pattern is distinctly different.

29. *Oncometopia tartarea* (Stål).

Phera tartarea STÅL, Stett. Ent. Zeit., xxv., 1864, p. 78.

Oncometopia tartarea FOWLER, Biol. Cent.-Am., Homop., II, 1900, p. 229.

Robust; head wider than pronotum; eyes prominent, produced and declivous in front; vertex as long as width between the eyes; front with median carina and strong lateral arcs; clypeus subcarinate, contracted at tip; pronotum narrowing posteriorly, with depressed areas near anterior border, minutely rugose; head, pronotum, and scutellum minutely pilose. *Genitalia: male*, last ventral segment as long as preceding; plates very short, blunt, about one-fourth length of pygofer; pygofer with convergent margins, rounded behind.

Purplish-black; elytra and wings milky hyaline; veins blackish. Length: 11 mm.

One specimen, Santarem, Brazil, April, 1919, Carn. Mus. Acc. No. 6324 (S. M. Klages *coll.*).

30. *Oncometopia cincta* (Signoret).

Tettigonia cincta SIGNORET, Ann. Soc. Ent. Fr. (3) II, 1854, p. 363.

Head broad; eyes prominent; vertex twice as long at middle as next the eye; front much swollen; clypeus elevated at base, carinate, contracted at tip; pronotum narrowed behind, furrowed behind anterior border and with deep depressions at the sides; hind border concave. *Genitalia: male*; plates small, elongate, triangular; tips narrowed, somewhat angulate, upturned, less than half as long as pygofer; pygofers broad, divergent posteriorly; hind border obliquely truncate.

Dark fuscous or purplish; head pale purple with two irregular black stripes on the vertex, expanded at the ocellus; a stripe each side of the disk on the front; apex of front, clypeus, and loræ, black; pronotum dark fuscous or black, with some small points anteriorly and the posterior submargin, orange; scutellum and elytra purplish-fuscous; apex of elytra smoky-hyaline; wings smoky-blackish; abdomen above black, with borders of segments and pygofer, purple; legs dark fuscous with apex of femora, and base of tibiæ, purplish. Length: 11.5 mm.

One specimen, Puerto Suarez, Bolivia, 150 m., Carn. Mus. Acc. No. 3844 (J. Steinbach *coll.*).

31. *Oncometopia rosipennis* sp. nov. Pl. XII, figs. 14, 14a.

Head large, wider than pronotum, distinctly angulate and sub-conical in front; vertex nearly as long as width between the eyes; ocelli mid-way between eyes and middle line; front swollen, flattened on the disk; clypeus distinctly swollen near base, narrowing to apex; tip rounded; pronotum as long as vertex; side borders short; anterior border strongly arched; hind border slightly concave. *Genitalia: male*, plates small, together only about half as wide as the last ventral segment, narrowing rapidly to near middle and extended as slender acute upturned points reaching two-thirds length of the pygofer; pygofer broad; hind border obtusely angulate each side.

Yellowish-gray; basal disk of pronotum and all of elytra, except patch on the costal base and apical cells, rose-purple, mostly covered with a delicate pruinosity, which is absent on the apical part of anteapical cells; abdomen above dusky; borders yellowish with bases of brown; below, gray-brown; abdomen ivory-yellow, with a brown patch on the segments on each side, and another on the connexivum, pale brown; tips of tibiæ and tarsal joints, dusky. Length: male, 9.5 mm.

Described from one specimen, male (type), Cacagualito, Colombia, May, Carn. Mus. Acc. No. 1999 (H. H. Smith coll.).

Genus *DILOBOPTERUS* Signoret.

Dilobopterus SIGNORET, Rev. et Mag. Zoöl., 1850, p. 284. (Genotype *Dilobopterus decoratus* Signoret, *l. c.*, p. 185, pl. 4, fig. 5.)

32. *Dilobopterus varius* sp. nov.

Genitalia: female, last ventral segment about twice the length of the preceding, truncate at tip and carinate from the middle line; *male*, last ventral segment widening toward the tip, which is faintly carinate with the plates, together about half the width of the preceding segment, tapering to a slender up-turned pointed tip, the margins with slender cilia.

Black, the vertex faintly margined with lighter, mostly shiny deep black. Front polished, lateral arcs black, cheeks at base white, loræ, clypeus, pronotum, scutellum and base of elytra velvety black. Central part of elytra a brownish hyaline; anteapical cells fuscous; apical cells smoky hyaline, costal border dark brown, tinged with reddish; below sides white, legs black at base. Apex of femur and base of tibia white, margined with white, abdomen otherwise black. The large appendage of the hind wing is of a dense velvety black, evidently the same as in *D. burmeisteri* Signoret. Length: 8 mm.

Nine specimens from Bartica, British Guiana, secured from H. S. Parish. Specimens from Mana River, French Guiana, in the Carnegie Museum, collected by S. M. Klages.

This form is close to *D. burmeisteri*, which is recorded from Mexico, from which it seems to differ only in the black scutellum and lack of orange stripes at base of wing-appendage. I should hesitate to call it more than a variety of that species, but the specimens at hand seem constant in the distinctive characters.

The very remarkable lobular appendage on the hind wings which characterizes this and other species of the genus, and which is folded over the abdomen and apparently occupies the same position when expanded, would seem to be of practically no value in flight and its function is a most puzzling problem.

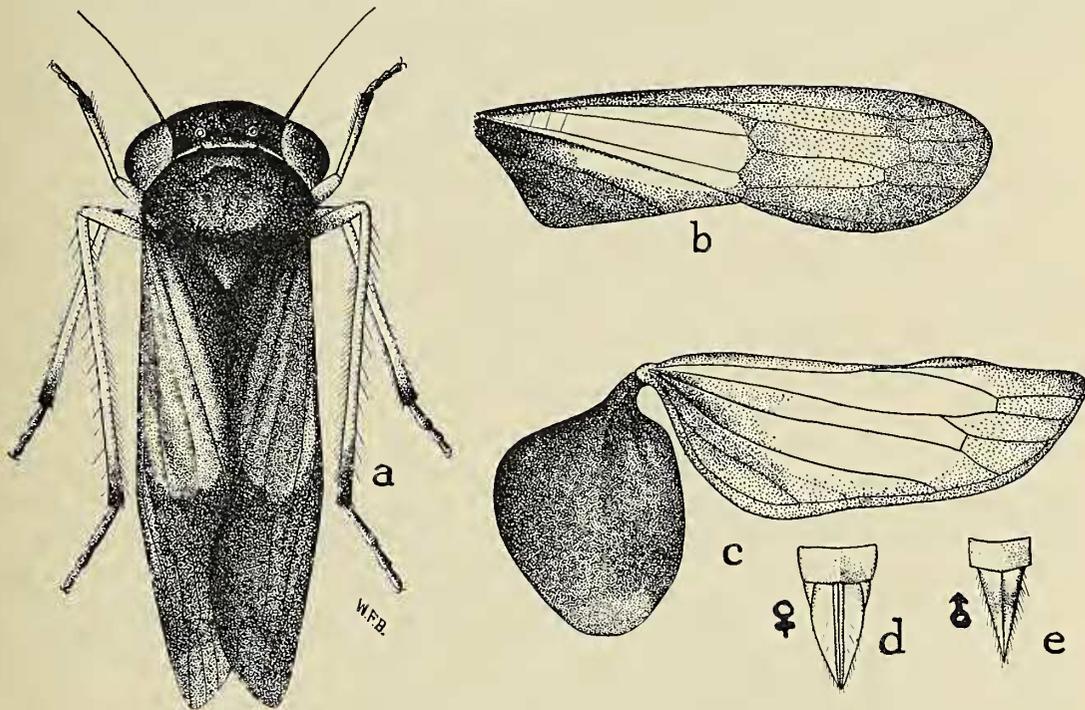


FIG. 1. *Dilobopterus varius* sp. nov. a. dorsal view; b. elytron; c. wing, showing broad anal lobe; d. female and e. male genitalia. (From original drawing by Mrs. W. V. Balduf, magnified 6.6 diam.)

33. *Dilobopterus discoidea* (Fabricius).

Cicada discoidea FABRICIUS, Syst. Rhyng., 1803, p. 73.

Tettigonia discoidea SIGNORET, Ann. Soc. Ent. Fr. (3) I, 1853, p. 30.

Genitalia: male, valve wanting; plates very narrow, extending into long up-turned tips reaching the end of the pygofer.

Similar to *D. demissa*, with pronotum black on the borders and middle line, but with large discal areas yellow fulvous; middle line of front and clypeus with lower part of cheeks polished black; sides of cheeks and stripe along the sides of the body running into the margins of abdomen ivory-white or yellowish; base of femora black; elytra hyaline, except the veins, and a rather broad costal line.

One specimen from Chapada, Brazil, Jan. 19, Carn. Mus. Acc. No. 2966 (H. H. Smith *coll.*) is referred to this species.

34. *Dilobopterus myopa* (Fabricius).

Cicada myopa FABRICIUS, Ent. Syst., IV, 1794, p. 33; Syst. Rhyng., 1803, p. 73.
Tettigonia myopa SIGNORET, (near *Stolli* Signoret), Ann. Soc. Ent. Fr. (3) I, 1853, p. 31.

Head obscure, golden yellow, with median line and lateral punctures black; thorax with a yellow line before; a median stripe and posterior margins black; body fuscous, hind femora yellow (Fabricius).

This species does not seem to have been recognized by Signoret as belonging to his genus *Dilobopterus*, but it is evidently closely related to *D. stolli*, as Signoret points out, and also to *D. discoidea*.

35. *Dilobopterus klugi* Signoret.

Dilobopterus klugi SIGNORET, Rev. et Mag. Zoöl., 1850, p. 287, pl. 4, fig. 6.
Tettigonia klugi SIGNORET, Ann. Soc. Ent. Fr. (3) I, 1853, p. 31, pl. 2, fig. 5.

Yellow; black above with numerous yellow spots; a scutellar stripe golden-yellow; elytra hyaline at base with brown at apex, including a yellow band. Length: 9 mm.

Originally described from specimens from Cayenne and Brazil. Not seen.

36. *Dilobopterus stolli* Signoret.

Dilobopterus stolli SIGNORET, Rev. et Mag. Zoöl., 1850, p. 287, pl. 4, fig. 7.
Tettigonia stolli SIGNORET, Ann. Soc. Ent. Fr. (3) I, 1853, p. 33.

Yellow; margin of thorax and a middle stripe brown; the elytra hyaline with brown bands, a large yellow-white fascia, and a hyaline fascia with the apex brown. Length: 10 mm.

Signoret describes this from "Colombia," but I have not seen specimens which seem to fit his description.

37. *Dilobopterus fervens* Walker.

Dilobopterus fervens WALKER, List. Homopt. B. M., pl. 3, 1851, p. 809.
Tettigonia fervens SIGNORET, Ann. Soc. Ent. Fr. (3) I, 1853, p. 35.

Yellow; black above; the head, apical and lateral spots, the thorax and scutellum, and the transverse bands, yellow; elytra hyaline, with a brown band behind the middle, striped with yellow-white. Length: 14 mm.

Described from Pará, Brazil.

38. *Dilobopterus vicina* (Signoret).

Tettigonia vicina SIGNORET, Ann. Soc. Ent. Fr. (3) I, 1853, p. 35, pl. 2, fig. 9.

Yellow; fulvous above, the head with two longitudinal stripes; the pro-thorax with three transverse bands, and the apex of scutellum

black; elytra brown with three hyaline yellow stripes; the apex fuscous, preceded by a hyaline yellow band.

Originally described from Brazil.

39. *Dilobopterus bimaculatus* Signoret.

Dilobopterus bimaculatus SIGNORET, Rev. et Mag. Zoöl., 1850, p. 286.

Tettigonia bimaculata SIGNORET, Ann. Soc. Ent. Fr. (3) I, 1853, p. 26.

Head rounded, broad; body yellow with a pair of black spots near the anterior border of vertex, on the pronotum and base of scutellum; elytra whitish hyaline at base, smoky on outer third; beneath yellowish above, brown below with the lateral border yellow; feet entirely yellow. Length: 6 mm.

Described by Signoret as from Rio Janeiro.

40. *Dilobopterus dispar* (Germar).

Tettigonia dispar GERMAR, Mag. d. Ent., IV, 1821, p. 71.

Dilobopterus decoratus SIGNORET, Rev. et Mag. Zoöl., 1850, p. 285.

Tettigonia dispar SIGNORET, Ann. Soc. Ent. Fr. (3) I, 1853, p. 27.

Head considerably produced before the eyes; yellow above, brown varied with yellow below; elytra yellowish hyaline on basal two-thirds; apical one-third fuscous with a cross-band of yellow hyaline toward apex; feet yellow. Length: 8 to 9 mm.

Originally described from Bahia, Brazil.

41. *Dilobopterus demissa* (Fabricius).

Cicada demissa FABRICIUS, Syst. Rhyng., 1869, p. 73.

Tettigonia cephalotes WALKER, List Homopt. Ins. B. M., Pt. 2, 1851, p. 759.

Tettigonia multicolor WALKER, l. c., p. 760.

Tettigonia demissa SIGNORET, Ann. Soc. Ent. Fr. (3) I, 1853, p. 29, pl. 2, fig. 4.

Tettigonia demissa STÅL, Hemipt. Fabric., 1869, p. 70.

Head broad, much wider than thorax, rounded in front, somewhat produced, black; face white at the sides with numerous black arcs; vertex black with small fulvous spots at base. Pronotum black, two round fulvous spots on the disk; scutellum black with lateral spots and apex yellow or fulvous; elytra hyaline; costa brown; beneath blackish with sides yellow; abdomen above black. Length: 7 mm.

Specimens from Rioja, Peru, and Bartica, British Guiana, April 18, 1901, in author's collection.

One specimen referred to this species is from Chapada, Brazil, Carn. Mus. Acc. No. 2966 (H. H. Smith coll.).

42. *Dilobopterus exaltatus* (Fabricius).

Cicada exaltata FABRICIUS, Syst. Rhyng., 1803, p. 71.

Tettigonia exaltata SIGNORET, Ann. Soc. Ent. Fr. (3) I, 1853, p. 32.

A handsome golden-yellow species, with fuscous arcs on the head extending from front part of vertex down on the face, separated by a broad unmarked space; ocelli black; pronotum golden-yellow, with a broad brown border at sides and behind; elytra with a broad yellowish hyaline area extending to tip of clavus, a broad dark brown area including bright yellow bands; apex smoky hyaline; beneath yellow; tibiæ embrowned; abdomen brown above, yellow below; last ventral segment longer than the preceding, the middle portion produced, slightly sinuate.

Numerous specimens from Santarem, April 19, and July, 1919, collected by S. M. Klages, Carn. Mus. Acc. No. 6324; Los Ojos, Bolivia, Carn. Mus. Acc. No. 5063; Las Juntas, Bolivia, December, Carn. Mus. Acc. No. 5066 (Steinbach coll.). A specimen in the author's collection, slightly slenderer, has the yellow bar and brown area reduced to an oval spot. This species was described from "America meridionali," and Signoret specifies Pará as a locality.

43. *Dilobopterus hexapterus* (Burmeister).

Tettigonia hexaptera BURMEISTER, Handb. der Ent., II, pt. I, 1835, p. 118. (Stoll, fig. 162.)—SIGNORET, Ann. Soc. Ent. Fr. (3) I, 1853, p. 33.

This species is described as luteous with the hind margin of the pronotum and the margin of elytra and behind the middle ferruginous, punctate with yellow. Signoret suggests that it may be the same as *T. exaltata* Fabricius. It is credited to Pará by its author.

44. *Dilobopterus syrphoidula* (Jacobi).

Tettigoniella syrphoidula JACOBI, Sitzb. d. Gesel. Naturf. Freunde, Berlin, 1905, p. 170.

Head much wider than pronotum, rounded in front; pronotum half longer than vertex, narrowing slightly behind, hind border concave. *Genitalia: male*, valve hidden; plates small, narrow, contracted before the middle, and extending in long slender tips to end of pygofer.

Black, with yellow markings and yellow beneath, elytra hyaline, costa brown, legs yellow. Length: 9 mm.

One specimen in the Carnegie Museum from Chapada, Brazil, March, Carn. Mus. Acc. No. 2966 (H. H. Smith coll.) is referred to this species, although the pronotum has more yellow than is present

on specimens presumed to be from the Jacobi material in my collection. It is also represented from Asunción, Paraguay, Carn. Mus. Acc. No. 3773 (Haseman *coll.*). I have in addition several specimens from Bolivia, which agree with the Chapada specimen. The Jacobi specimens are labeled Rioja, Peru.

Genus *CICADELLA* Latreille.

Cicadella LATREILLE, in Cuvier, Règne Animal, III, 1817, p. 406. (Orthotype *Cicada viridis* Linnæus, Syst. Nat., Ed. x, 1758, p. 438.)

45. *Cicadella oculata* (Signoret).

Tettigonia oculata SIGNORET, Ann. Soc. Ent. Fr. (3) I, 1853, p. 344.

Broad, head as wide as pronotum, rounded anteriorly.

Yellow; head with two black spots at front; the hinder border and submarginal band on pronotum, black; elytra brown with numerous yellow dots interrupted beyond the tip of clypeus, forming a blackish arc within which is a conspicuous brown-yellow spot; tips brownish; abdomen rose-color; feet yellowish red. Length: 9 mm.

Provincia del Sara, Bolivia, 450 m., Carn. Mus. Acc. No. 5064 (Steinbach *coll.*) and Don Amo, Colombia, Carn. Mus. Acc. No. 1999 (H. H. Smith *coll.*).

46. *Cicadella gratiosa* (Blanchard).

Tettigonia gratiosa BLANCHARD, Hist. Nat., III, 1840-1841, p. 191.

Tettigonia gratiosa SIGNORET, Ann. Soc. Ent. Fr. (3) I, 1853, p. 343.

Head as wide as pronotum, angulate; vertex about half as long as pronotum. *Genitalia: female*, segment acuminate.

Orange yellow; vertex with three black lines bifurcate anteriorly; prothorax with two lines near the middle and two at each side, forked in front; elytra brown with numerous minute dots of yellow, greenish, or bluish, arranged in series; a distinct round yellow spot beyond clavus; apex brownish; below yellowish. Length: 9 mm.

Chapada, Brazil, Carn. Mus. Acc. No. 2966 (H. H. Smith *coll.*); Provincia del Sara, Bolivia, 450 m., Carn. Mus. Acc. No. 5064 (Steinbach *coll.*).

47. *Cicadella inspergata* (Signoret).

Tettigonia inspergata SIGNORET, Ann. Soc. Ent. Fr. (3) III, 1855, p. 770.

Very similar to *gratiosa*, but differing in the absence of the apical spot on the elytra, and by blackish lines on the head and prothorax,

which in this species are replaced by a basal band, on the prothorax by a transverse band as in *C. oculata*. Length: 11 mm.

Provincia del Sara, Bolivia, 450 m., Carn. Mus. Acc. No. 5064 (Steinbach coll.).

48. *Cicadella nebulosa* (Signoret). Pl. XII, figs. 19, 19a, 19b.

Tettigonia nebulosa SIGNORET, Ann. Soc. Ent. Fr. (3) II, 1854, p. 343.

Head wider than pronotum, subangulate in front, rounded; vertex twice as long at middle as next the eye, sloping to front; front convex; clypeus obtusely angulate and profile with a contracted, elevated area toward the apex; pronotum strongly arched before, hind border nearly straight; head, pronotum, scutellum, and elytra, except at extreme tip, minutely punctate. *Genitalia: female*, last ventral segment a little longer than preceding, narrowed toward tip, with a median, blunt tooth, on each side of which is a slight notch; *male*, valve distinct, obtusely angulate behind, plates short, broad at base, acutely angulate and upturned at apex, one-half as long as pygofer.

Dark brown, with minute yellowish dots on vertex, pronotum and basal and apical part of elytra with apex of scutellum and a large round spot at base of clavus, another on disk of corium, surrounded by a broad brown border unmarked with yellow; the apex subhyaline. Length: 6.5 mm. to 6.7 mm.

Eight specimens, seven from Taperina, Brazil, one from Santarem, Brazil, Carn. Mus. Acc. No. 2966 (H. H. Smith coll.).

In Signoret's description the locality is given as "Fernanbouc," no doubt Pernambuco.

49. *Cicadella discoidula* sp. nov. Pl. XII, figs. 15, 15a, 15b.

Head broad, distinctly angulate; vertex twice as long at middle as next the eye, more flattened than in *C. nebulosa*; front slightly flattened; clypeus scarcely angulate in profile, contracted and carinate toward the apex; pronotum a little longer than vertex, broadly arched in front, hind border nearly straight; scutellum small, acuminate; head, pronotum, scutellum, and elytra, minutely punctate, as in *C. nebulosa*. *Genitalia: male*, valve small, broadly angulate behind; plates very small, as wide as the valve at base, narrowing to acute upturned points, scarcely one-fourth as long as pygofer.

Dark brown, minutely dotted or irrorate with yellowish, with a large whitish spot on disk of elytra and a transverse band toward apex, extending from costa to the claval areole, near tip of clavus; the legs are brown, maculate with yellowish. Length: 7 mm.

Described from one specimen, male (type) from Chapada, Brazil, January, Carn. Mus. Acc. No. 2966 (H. H. Smith coll.).

This species is very similar to *C. nebulosa* in color and the minute puncturing of the surface, but does not have the yellowish dots distributed so uniformly and the spot at the middle of elytra and the transverse band are whiter; it lacks, also, the yellowish apex of scutellum and basal spot on clavus which appear to be characteristic of *C. nebulosa*.

50. *Cicadella notulatula* sp. nov. Pl. XII, figs. 16, 16a, 16b.

Head wider than pronotum, strongly angled in front; vertex twice as long at middle as next the eye, rounded to front; apex more acute; front striate at sides; clypeus rounded, contracted and carinate at tip; pronotum a little longer than vertex, sub-striate; head, pronotum, scutellum, and elytra minutely punctured, as in *C. nebulosa*. *Genitalia: female*, last ventral segment produced, obtusely angulate, minutely notched at tip; pygofers tumid at base, compressed at apex.

Dark brownish fuscous, densely spotted with yellowish, with a small spot at base of clavus, another at base of corium, a distinct spot near the middle and a group of small spots near the costa toward apex, dull white. Beneath fuscous, irregularly maculate with whitish. Length: 7 mm.

Described from one specimen, female (type) Provincia del Sara, Bolivia, 450 m. (J. Steinbach coll.).

This species very closely resembles *C. nebulosa* and *C. discoidula*, especially in the puncturing of the surface, but differs in the color-markings. The three species evidently are derivatives from a common stock, and must be associated with *C. mucidula* Jacobi.

51. *Cicadella callosa* sp. nov. Pl. XII, figs. 17, 17a, 17b.

Head wider than pronotum, distinctly angulate in the female, sub-angulate in the male, in female nearly twice as long at middle as next the eye, shorter than the male; ocelli large, about half way from base to apex, very wide apart; front tumid, slightly flattened on the disk; clypeus large, elevated, but not distinctly gibbous; pronotum one-half longer than vertex, transversely striate; hind border sinuate; elytral veins conspicuous, forking of outer sector callous. *Genitalia: female*, last ventral segment twice as long as preceding, truncate behind; *male*, last ventral segment one-half longer than preceding, hind border rounded, plates small, triangular, tips acute, about one-fourth as long as pygofer.

Gray-fuscous; vertex with a black dot on each side on hind border, two converging dots at apex; a transverse brown band interrupted by ocellar margins; front with conspicuous lateral arcs, a yellow discal patch margined with fuscous; pronotum with fuscous lineate spots on anterior border, disk irrorate; scutellum with black triangles at base

and a yellow apex; elytra brownish fuscous with yellowish veins, with a broad yellow callous at the forking of outer sector. Beneath gray; tarsal claws black. Length: 4 mm.

Female (type) from Puerto Suarez, Bolivia, 150 m., Carn. Mus. Acc. No. 3844; female (paratype) Provincia del Sara, Bolivia, 450 m., Nov., 1909, Carn. Mus. Acc. No. 4549 (J. Steinbach *coll.*). Male (allotype) Bom Fin, Bahia, Brazil, Nov. 3, 1907, Carn. Mus. Acc. No. 3420 (J. D. Haseman *coll.*).

52. ***Cicadella interstitialis*** (Signoret).

Tettigonia interstitialis SIGNORET, Ann. Soc. Ent. Fr. (3) III, 1855, p. 789, pl. 24, fig. 8.

Head obtusely angulate, shorter than pronotum.

Brown, vertex lineate and pronotum dotted with yellow. Length: 10 mm.

A specimen from Provincia del Sara, 450 m., Carn. Mus. Acc. No. 5064, 1913 (Steinbach *coll.*) is referred to this species.

53. ***Cicadella lituriceps*** sp. nov. Pl. XII, figs. 18, 18a, 18b.

Head large, wider than pronotum, subangulate; vertex about as long at middle as next the eye; front tumid, slightly flattened on the disk; clypeus large, but scarcely tumid at base, sloping gradually to the narrow tip; pronotum one-half longer than vertex, hind margin nearly straight; scutellum large. *Genitalia: female*, last ventral segment long, more than twice as long as preceding; hind border produced, but not angulate; *male*, valve very small, short, not as wide as base of plates, plates rather broad, outer border rounded to near the short, acuminate, upturned tips, which reach about half the length of the pygofer.

Light yellowish, with head, pronotum, and scutellum rather densely inscribed with broken lines and dots, which, especially at side of front, are arranged in fairly definite arcs; elytra brown-fuscous, thickly spotted with ivory-yellow or whitish, except at apex, which is smoky hyaline. Beneath pale yellowish; legs with spines of hind tibiae and the tips of tarsi, dusky. Length: female, 7 mm.; male, 6 mm.

Described from four specimens, two females (type and paratype) and two males (allotype and paratype) from Minca, Colombia, May and June, 1898, Carn. Mus. Acc. No. 1999 (H. H. Smith *coll.*).

54. ***Cicadella tinctorula*** sp. nov. Pl. XII, figs. 20, 20a.

Head large, much wider than pronotum, produced before the eyes, rounded; vertex three times as wide as long; front tumid, somewhat flattened on the disk; clypeus swollen at base, contracted at tip;

pronotum twice as long as vertex, hind border nearly straight. *Genitalia: female*, last ventral segment mutilated, apparently produced into a long, blunt tooth; *male*, last ventral segment equal to preceding; plates very short, angular at tip, about one-fourth as long as pygofer.

Light yellowish; vertex, pronotum, and scutellum with irregular brown-fuscous markings connecting in such manner as to produce numerous irregular reticulations; elytra reddish brown, closely maculate with greenish yellow; front with fuscous stripes at the margin of the disk, uniting on base of clypeus; tip of clypeus and margin of cheek beneath the eye fuscous. Abdomen above reddish; legs light yellow; tips of tarsi dusky. Length: female, 7 mm.; male, 6 mm.

Two specimens, one female (type) Minca, Colombia, May, 1898; one male (allotype) Bonda, Colombia, Carn. Mus. Acc. No. 1999 (H. H. Smith *coll.*).

This species has much of the pattern of *T. dubia* Signoret, and a similar female segment, but the picture of the face is very different and the size somewhat larger.

55. *Cicadella interruptula* sp. nov. Pl. XII, figs. 21, 21a.

Head slightly wider than pronotum, rounded, subangulate in front; vertex twice as long at middle as next the eye, distinctly convex; front tumid, scarcely flattened on the disk; clypeus swollen at base, contracted, narrow at tip; pronotum nearly half longer than vertex, hind border faintly sinuate. *Genitalia: female*, last ventral segment long, slightly produced, and subangulate on the hind border; *male*, plates round at base, contracted beyond the middle, extended as slender upturned tips, reaching three-fourths length of the pygofer.

Testaceous yellowish; vertex with fuscous lines uniting before the eyes and extended down each side of front, with a distinct dot at tip and a fuscous ring around each ocellus; pronotum greenish olive, the anterior border somewhat yellowish and a blackish irregular band on each side connected by a narrow band on anterior border; scutellum yellowish with lateral angles and discal spot black; elytra fuscous, or blackish, with interrupted greenish and yellowish stripes on clavus, and an uninterrupted stripe on base of apical cells; costa hyaline; apex smoky. Beneath testaceous; abdomen above blackish with margins yellowish; tips of tarsi dusky. Length: female, 5 mm.; male, 4.5 mm.

Described from two specimens, one female (type), male (allotype) from Chapada, Brazil, November, Carn. Mus. Acc. No. 2966 (H. H. Smith *coll.*).

The male has the coloration much more distinct and the stripes distinctly greenish, while the female appears to be faded, or to have been immersed in alcohol, but the color-pattern agrees very perfectly, so there seems no question as to the connection.

56. *Cicadella dorsifascia* sp. nov. Pl. XII, figs. 22, 22a.

Head large, wider than pronotum, produced, rounded; vertex nearly as long as width between the eyes; front tumid, slightly flattened; clypeus enlarged at base, subcarinate, contracted toward tip; pronotum a little longer than vertex, strongly arched in front, side margins short; hind border straight. *Genitalia: female*, last ventral segment long; hind border produced, truncate, or broadly notched on hind border.

A broad reddish brown stripe on each side extending before the eyes and meeting on the front and including sides of pronotum, outer angle of scutellum, and most of elytra, except clavus; a broad stripe bifid at tip of vertex extending across pronotum, occupying all except minute base of scutellum, and all of clavus except an irregular patch at base, and an oblique extension from tip of clavus onto antepical cell, light yellow, also a white or hyaline spot beyond middle of costa; apex smoky; veins toward apex bright red; front with short yellow arcs in the brown stripe on base; the lower part of clypeus and cheeks, yellow, tinged with orange. Abdomen above red, beneath yellow; legs light yellow, slightly tinged with orange. Length: 6 mm.

One specimen, female (type) from Chapada, Brazil, October, Carn. Mus. Acc. No. 2966 (H. H. Smith *coll.*).

57. *Cicadella hyalinatula* sp. nov. Pl. XIII, figs. 23, 23a.

Slender, parallel; head large; eyes prominent; vertex roundly produced, about twice as long at middle as next the eye; front tumid; vertex swollen near the base, contracted toward tip; pronotum with sides parallel, anterior border strongly arched, hind border slightly concave. *Genitalia: female*, last ventral segment slightly longer than preceding, weakly carinate, and slightly produced at middle on hind border.

Pale yellowish, tinged with orange; a spot at apex, one on each side above antennæ, a narrow hind border at middle, two transverse spots on disk of pronotum, a spot at border behind the eyes and the hind margin, blackish; scutellum yellow; elytra dark honey-yellow, subhyaline, with a reddish brown transverse band on base of clavus, a triangular spot mid-way on inner border of clavus and a transverse band behind tip of clavus; wings a little more obscure than elytra; legs nearly concolorous. Abdomen above yellow, with orange bands; beneath pale yellow; the last ventral segment on the disk and the pygofer at apex tinged with orange; ovipositor brownish; apex fuscous; tarsal claws dusky. Length: 9 mm.

One specimen, female (type) from Minca, Colombia, June, Carn. Mus. Acc. No. 1999 (H. H. Smith *coll.*).

58. *Cicadella longicornis* sp. nov. Pl. XIII, figs. 24, 24a.

Head scarcely wider than pronotum, rounded and subtruncate before; vertex nearly twice as wide as length at middle; front broad, broadly flattened on the disk, tumid toward the tips; clypeus tumid at base, subcarinate toward tip; apex narrowed and rounded; antennæ very long, extending nearly to the genital segment; pronotum nearly twice as long as vertex, depressed, somewhat sulcate anteriorly, hind border rounded, slightly convex at middle; scutellum acuminate; tips spinose. *Genitalia: male*, last ventral segment equal to preceding; plates nearly as wide at base as hind segment, tapering into long, acute, upturned, compressed tips, reaching beyond tip of pygofer.

Bright orange; the large subtriangular patch, anterior part of vertex, ocelli, a patch at the lower part of front on each side, eyes, antennæ, except at base, a double patch on hind border of pronotum and scutellum, black; elytra dark purplish, with a blackish base and two bands beyond the clavus; the tip whitish hyaline; legs orange at base; outer tarsi blackish. Abdomen entirely purplish black. Length: 14 mm.

Described from one specimen (type) Hyutanahan, Rio Purús, Brazil, Feb., 1922, Carn. Mus. Acc. No. 6993 (S. M. Klages coll.).

This very handsome species does not seem to appear among the descriptions of the tropical Cicadellids, although it is such a conspicuous form that it could hardly be overlooked if occurring in any wide distribution.

59. *Cicadella terminalis* sp. nov. Pl. XIII, figs. 25, 25a.

Head very broad, rounded before; vertex scarcely longer at middle than next the eye; ocelli near the base; front tumid, polished, with distinct striae at the sides; clypeus tumid near the base; apex contracted; pronotum broadly arched in front, lateral margin long, posterolateral angle rounded, hind border convex; scutellum large; abdomen slender, tapering; elytra narrow, tips round. *Genitalia: male*, plates narrow, elongate, contracted beyond the middle; tips conically acute, slightly upturned, reaching three-fourths length of the pygofer; pygofer elongate, somewhat compressed toward the tip, densely set with short, stiff hairs.

Golden-yellow, paler beneath; vertex with a round black spot anteriorly, extending down upon the front; ocelli and eyes black; pronotum with anterior and posterior borders black; a broad central band orange-red; scutellum black, with a basal patch on the disk and a lunate transverse band before the apex, orange-red; elytra subhyaline, honey-yellow with broad inner border of clavus and subclaval stripe widening behind and the costal border and nervures, fuscous; apex smoky; an orange-red oblique stripe crossing the antepical cells; abdomen above black; pygofer orange-yellow; tips of tarsi blackish. Length: 9 mm.; to tip of elytra, 9.5 mm.

One specimen, male (holotype), Mana River, French Guiana, May, 1917, Carn. Mus. Acc. No. 6008 (S. M. Klages *coll.*).

This species falls in the group with *obliquatula* Jacobi, with which it agrees closely in size, but from which it differs distinctly in the pattern of coloration on pronotum, scutellum, and elytra.

60. *Cicadella subhyalina* sp. nov. Pl. XIII, figs. 27, 27a, 27b.

Elongate, parallel; head broad; eyes prominent; vertex nearly twice as long at middle as next the eye, subangulate; front tumid; clypeus a little swollen at base, narrowed to tip; pronotum with sides parallel, anterior border strongly arched; hind border slightly concave; scutellum acuminate; elytra long, narrowed. *Genitalia: female*, last ventral segment half longer than preceding; hind border slightly concave.

Pale yellow, tinged with orange; vertex with anterior border, a transverse line before ocelli, pronotum with anterior and posterior borders, scutellum with discal and apical bands and elytra with four transverse bands, reddish-brown; disk of pronotum orange-red; elytra reddish hyaline; a more transparent area between the two apical bands and the tips, smoky-hyaline; beneath pale yellow; tarsi dusky; abdomen above red; beneath pale yellow with basal segments brown; ovipositor black. Length: 12 mm.

Described from three female specimens (type and paratypes); one from Valparaiso, 2500 ft., Department Magdalena, Colombia, May, 1898; two from Cacagualito, Colombia, May, Carn. Mus. Acc. No. 1999 (H. H. Smith *coll.*).

This species quite closely resembles *T. bracteata* Jacobi, male specimens of which I have from Riojo, Peru. It may be possible that the specimens before me are the females of that species, but they are so different in some details that they cannot be placed there with certainty.

61. *Cicadella nubacula* sp. nov. Pl. XIII, figs. 30, 30a.

Head broad, eyes conspicuous, vertex short, with a transverse furrow, pronotum twice as long as vertex. *Genitalia: male*, valve short; plates elongate, contracted before the middle, the slender tip extending to end of pygofer.

Purplish, minutely dotted with yellow and green spots; face brown, with numerous yellow dots, the latter ones arranged in arcs; abdomen beneath ochreous. Length: 10 mm.

Four specimens, Archidona, Ecuador, in the author's collection. These specimens, secured from a German dealer, are labelled *Tetti-gonia nubacula* Breddin, but I have been unable to find any reference to such a species in the literature and conclude it must be a manu-

script name. I retain the name, however, and if a description has been published the species should be credited to Breddin.

62. *Cicadella brunneatula* sp. nov. Pl. XIII, figs. 33, 33a.

Head rather narrow, scarcely as wide as pronotum; vertex about half as long as width between eyes, somewhat produced before the eyes; front distinctly flattened on the disk; scutellum large, somewhat swollen at base, narrowed, obtusely carinate toward tip; pronotum widening behind, twice as long as vertex; hind border nearly straight; elytra with cross-veins very few or obsolete. *Genitalia: male*, last ventral segment somewhat elongate; plates narrow, elongate, acute; tips reaching nearly to end of pygofer, rather densely set with marginal hairs and a number of short bristles.

Brown, somewhat infusate; an elongate spot extended from tip of vertex on to front; a transverse spot back of and between ocelli; ocelli, eyes, setæ of antennæ, two large semicircular spots on pronotal disk, black; the elytra with broad fuscous or blackish stripes between the veins, which are rather broadly brown or coppery; the tips smoky; wings smoky black; tibiæ and tarsi infusate. Length: 9.5 mm.

One specimen, male (type) Incachaca, Bolivia, 2500 m., Carn. Mus. Acc. No. 6873 (J. Steinbach coll.).

63. *Cicadella clitellaria* sp. nov. Pl. XVI, figs. 70, 70a.

Head wider than pronotum, subangulate; vertex produced, half longer at middle than next the eye; front tumid; clypeus rounded, subcarinate; apex rather broadly rounded; pronotum half longer than vertex, strongly arched in front; hind border truncate, or faintly concave. *Genitalia: female*, last ventral segment twice as long as preceding; hind border produced into a broad rounded, scarcely angulate lobe.

Whitish and dark fuscous; the vertex broadly fuscous at base, with indented white margin; front mostly white, lower border and broad stripe across clypeus, loræ and cheeks, fuscous; a narrow border of clypeus and cheek, white; pronotum fuscous, with a median line widening at base, white; a broad stripe across scutellum widening and then contracted on the clavus, white, with central line of scutellum and commissural line, yellow; angles of scutellum and outer base of clavus, all of corium, except a narrow costal margin, fuscous; costa with broken whitish-hyaline margin. Beneath, with legs, whitish; abdomen above and the pygofer below, fuscous. Length: 4.5 mm.

Described from two females (type and paratype) Chapada, Brazil, November, Carn. Mus. Acc. No. 2966 (H. H. Smith coll.).

This species has somewhat the picture of *variegata* (Fabricius), but is much smaller and the details of pattern as well as shape of vertex, are quite different.

64. *Cicadella apicula* sp. nov. Pl. XVI, figs. 67, 67a.

Head wider than pronotum, rounded in front; vertex produced, twice as long at middle as next the eye; front tumid; clypeus obtusely carinate; pronotum scarcely longer than vertex, hind border slightly concave. *Genitalia: male*, plates narrow, small, sunken between pygofer; tips acute, about half as long as pygofer.

Above mostly purple-black; anterior border of vertex striate with whitish; tip of scutellum yellowish white; a broad sulphur yellow band near base of clavus, extending from middle of scutellum to about the middle of clavus; another yellow band across tip of clavus, extending half-way down to costa; a small whitish triangle near the apex; wings smoky; beneath face light yellow, with darker striæ at the sides; a black stripe running from antennal pits to base of clypeus; mesosternum and pleural pieces blackish. Abdomen whitish below, dark above; basal part of pygofer and male plates more or less infuscate; legs testaceous white; tarsi dusky. Length: 5.5 mm.

Described from one specimen, male (type) from Provincia del Sara, Bolivia, 450 m., Nov. 1909, Carn. Mus. Acc. No. 4549 (J. Steinbach coll.).

65. *Cicadella cruenta* (Fabricius).

Cicada cruenta FABRICIUS, Ent. Syst., V, Supplement, 1798, p. 521; Syst. Rhyng., 1803, p. 67.

Tettigonia cruenta SIGNORET, Ann. Soc. Ent. Fr. (3) II, 1854, p. 7, pl. I, fig. 3.—STÅL, Hemipt. Fabric., II, 1869, p. 73.

Head scarcely wider than pronotum, produced, subangulate, rounded before; vertex nearly as long at middle as between the eyes; front tumid, slightly flattened on the disk; clypeus elevated at base, narrowed, subcarinate toward tip; pronotum slightly longer than vertex; hind border faintly emarginate. *Genitalia: female*, last ventral segment produced at the lateral angles into a blunt tooth and at the middle into a somewhat longer, angular tooth, strongly carinate.

Dull yellowish, the vertex, hind part of pronotum, most of clavus, broad costal border and an oblique stripe from tip of clavus to membrane, orange-red; legs tinged with reddish; base of vertex between ocelli, a spot on each side at apex, a transverse band across middle of pronotum, hind border next to scutellum, all of scutellum and a narrow marginal base of clavus, a triangular patch at middle of clavus, and a broad discal stripe on corium, black; costa yellow-hyaline. Abdomen above black, margined with orange; tip of pygofer orange beneath. Length: 6 mm.

Specimens from Santarem, June, 1919; Villa Braga, Brazil, July, 1919; Benevides, Brazil, Oct. 18, 1919, Carn. Mus. Acc. No. 6174;

Mana River, French Guiana, Carn. Mus. Acc. No. 6173, (S. M. Klages coll.). Provincia del Sara, 450 m., and Rio Guaporé (J. Steinbach coll.). There are also specimens from Bartica, British Guiana, in the author's collection. The original record was from Cayenne. Signoret and Stål have listed the species from Rio de Janeiro.

66. *Cicadella rufipes* (Fabricius.)

Cicada rufipes FABRICIUS, Syst. Rhyng., 1803, p. 68.

Tettigonia decora WALKER, List Homopt. B. M., 1851, p. 744.

Tettigonia rufipes SIGNORET, Ann. Soc. Ent. Fr. (3) I., 1853, p. 336, pl. 9, fig. 3.—
StÅL, Hemipt. Fabric., II. 1869, p. 72.

Head broad, short; borders of vertex nearly parallel; disk depressed; front flattened on disk, striate at the sides; clypeus long, elevated on the middle, subcarinate with about four depressions near the anterior border. *Genitalia: female*, last ventral segment large, nearly twice as long as the preceding; disk roughened with converging carina toward the hind border and a slightly produced broad emarginate tooth at the middle.

Black above, orange-red below; vertex with a large spot at base between ocelli, a large spot on either side of pronotum, a spot at each side of scutellum continued as a broad spot at base of clavus, another beyond middle of clavus and four on the corium, greenish white; front with a yellowish spot at base; clypeus, loræ, cheeks, and legs, except tarsi, orange-red. Abdomen above black, beneath orange; the last ventral segment of female and the pygofer, a narrow border next the ovipositor, black. Length: 14 mm.

Mana River, French Guiana, May 17, Carn. Mus. Acc. No. 6008 (S. M. Klages coll.). A specimen in the author's collection from Bartica, British Guiana, Aug. 1901, collected by H. S. Parish.

This is a handsome species, very conspicuously marked by the greenish white spots on the black upper surface and the orange-red under surface, beginning at tip of front.

67. *Cicadella fasciata* (Linnæus).

Cicada fasciata LINNÆUS, Syst. Nat., Ed. X, 1758, p. 436.—FABRICIUS, Ent. Syst., IV, 1794, p. 51.

Tettigonia miniata HOFFMANN, GERMAR, Mag. d. Ent., IV, 1821, p. 69.—WALKER, List Homopt. B. M., pt. 3, 1857, p. 734.

Tettigonia quadrivittata LE PELLETIER et SERVILLE, Encyc. Method., X, 1827, p. 601.

Tettigonia fasciata SIGNORET, Ann. Soc. Ent. Fr. (3) I, 1853, p. 359.

Head wider than pronotum, produced, rounded to front; vertex depressed between ocellus and eye; front rounded; clypeus tumid at

base, contracted at tip; pronotum subquadrate, arched in front, nearly truncate behind. *Genitalia: female*, last ventral segment about three times as long as preceding, somewhat spoon-shaped; hind border produced on each side of the broad median notch.

Light yellow or orange; the hind part of vertex, eyes, and front part of pronotum, a broad band across elytra including apex of scutellum, another including apex of clavus, and an apical band covering most of the tip, black. Abdomen above blackish toward apex, margins yellow; legs yellow; tarsi somewhat brownish. Length: 9 mm.

Specimens from Mana River, French Guiana, Carn. Mus. Acc. No. 6008, Pernambuco, Brazil (S. M. Klages *coll.*); also specimens in the author's collection from Bartica, British Guiana.

68. *Cicadella cardinalis* (Fabricius).

Cicada cardinalis FABRICIUS, Syst. Rhyng., 1803, p. 71.

Tettigonia cardinalis SIGNORET, Ann. Soc. Ent. Fr. (3) I, 1853, p. 686, pl. 22, fig. 15.

Head as wide as pronotum; vertex produced, broadly rounded in front; front tumid, slightly flattened on the disk; clypeus tumid at base, contracted at tip; pronotum somewhat widening behind, one-half longer than vertex, hind border scarcely sinuate. *Genitalia: female*, last ventral segment very much elongated, forming a long carinate spine, reaching to tip of the ovipositor.

Light yellow below, orange-red above; the spot at the front of the vertex, two square spots on the base, eyes, and a transverse spot produced at the sides on the front of pronotum, black; hind border of pronotum broadly brown-fuscous; scutellum, base, and a spot on the disk just behind the suture, brownish fuscous; elytra brownish fuscous, with a stripe along the outer border of clavus, a broad stripe on the inner border of disk, cardinal-red; a brilliant red oblique stripe from tip of clavus to apex; abdomen above blackish on the disk; sides yellowish tinged with red; tips of tibiae and tarsal joints narrowly fuscous. Length: 10 mm.

Mana River, French Guiana, June, 1917, Carn. Mus. Acc. No. 6008; Benevides, Brazil, Carn. Mus. Acc. No. 6174 (S. M. Klages *coll.*). A female in my collection from Bartica, British Guiana, Aug., 1901.

69. *Cicadella auroguttata* (Signoret).

Tettigonia auroguttata SIGNORET, Ann. Soc. Ent. Fr. (3) I, 1853, p. 373, pl. 12, fig. 16.

Head short, as wide as pronotum; vertex produced before the eyes, broadly rounded in front, depressed on the disk; front tumid; clypeus slightly elevated at base, carinate; pronotum nearly twice as long as vertex, slightly wider posteriorly; hind border convex. *Genitalia: male*, last ventral segment long; plates elongate, triangular,

narrowing nearly uniformly to the acute, slightly divergent tips, which reach almost to end of pygofer.

Lemon-yellow, tinged on vertex and base of pronotum, borders, and apex of elytra, and on the tibiæ with pale orange; beneath dull whitish. Length: 11 mm.

One specimen, Hyutanahan, Rio Purús, Brazil, March, 1922 (S. M. Klages *coll.*).

This specimen, while lacking the golden spots indicated by Signoret, agrees so closely in all other details that it seems unquestionably to belong here. In fact Signoret speaks of these spots as more numerous in the females.

70. *Cicadella pauperata* (Fabricius).

Cicada pauperata FABRICIUS, Syst. Rhyng., 1803, p. 71.

Tettigonia pauperata STÅL, Hemipt. Fabric., 1869, p. 77.

Head considerably produced, flattened and somewhat depressed each side the middle line on the vertex; front tumid; clypeus carinate. Pronotum as long as vertex, with a faint transverse depression parallel to the anterior border, light gray; the eyes and parts of elytra more or less suffused with yellow. The apex of elytra with an orange band; beneath light gray. *Genitalia: female*, last ventral segment more than three times as long as the preceding, narrowing to the rounded hind border with a median carina and slightly notched at tip; *male*, valve short or wanting; plates broad at base, short, and very abruptly narrowed, the tapering tips acute, and about a third the length of the pygofer.

Stål indicates two varieties, which seem to be represented in our material. Variety A, light gray, the elytra suffused with orange-yellow; variety B, lighter gray, with only an apical band of orange. These varieties may very easily intergrade, although the more definite orange band of variety B seems fairly well marked.

Specimens in the Carnegie Museum from Las Juntas and Provincia del Sara, Bolivia (Steinbach *coll.*); Mana River, French Guiana, May, 1917, Carn. Mus. Acc. No. 6008 (S. M. Klages *coll.*). There are also specimens in the author's collection, from Bartica, British Guiana, March 20; April 14 and 18; May 21; 1901 (H. S. Parish *coll.*). Evidently common in the northern and central parts of South America.

71. *Cicadella lurida* (Signoret).

Tettigonia lurida SIGNORET, Ann. Soc. Ent. Fr. (3) I, 1853, p. 662, pl. 21, fig. 1.

Head produced, rounded in front; vertex as long as width between the eyes; front tumid; antennæ long; pronotum slightly longer than

vertex, widening posteriorly. *Genitalia: female*, segment long, hind border produced, acuminate.

Entirely yellowish white, with elytra hyaline, suffused with yellow at base; hind border of segments whitish; feet whitish. Length: 11 mm.

Mana River, French Guiana, Carn. Mus. Acc. No. 6008 (S. M. Klages coll.).

72. *Cicadella mutabilis* (Signoret).

Tettigonia mutabilis SIGNORET, Ann. Soc. Ent. Fr. (3) I, 1853, p. 683, pl. 22, fig. 10.

Head rounded, somewhat produced; vertex nearly as long at middle as between the eyes; front tumid; prothorax broadly rounded in front, slightly widened behind; posterior border truncate.

Yellowish tinged with red; prothorax black with two red spots, sometimes yellowish; scutellum black; elytra blackish or purple-black, with a large spot near the center of the clavus, and another midway on the corium, these with the spots on the pronotum forming a double series nearly in line when the elytra are closed; vertex with a black spot extending down upon the front; abdomen red above, black below; genitalia red; feet yellow, or red. Length: 12 mm.

Entre Rios, Brazil, July 19, Carn. Mus. Acc. No. 2966 (H. H. Smith coll.).

73. *Cicadella sexguttata* (Fabricius).

Cicada sexguttata FABRICIUS, Syst. Rhyng., 1803, p. 75.

Tettigonia sexguttata SIGNORET, Ann. Soc. Ent. Fr. (3) I, 1853, p. 357, pl. 11, fig. 7.

—FOWLER, Biol. Cent.-Am., Homopt., V. II, 1900, p. 261.

Head as wide as pronotum, produced; apex nearly as long at middle as between eyes; front tumid; clypeus slightly swollen at base, contracted at tip; pronotum as long as vertex, truncate behind. *Genitalia: female*, last ventral segment short, truncate; hind border indentate; *male*, plates elongate, narrowing toward apex to acute spine-like tips, reaching three-fourths length of the pygofer.

Black above, yellow below; vertex with a bifid white ivory spot covering most of base; two narrow spots at apex and a dot near the eyes, whitish; a large spot on the pronotum bifid behind, and three spots on the elytra, ivory-white; a semicircular spot near apex red at base and smoky hyaline toward tip on apex. Abdomen dusky above; pygofer reddish; legs light yellow; tarsi tipped with dusky. Length: 6 mm.

This species occurs in northern South America; Central America; Panama; Nicaragua; West Indies.

74. *Cicadella sociata* (Fowler).

Tettigonia sociata FOWLER, Biol. Cent.-Am., Homopt., II, 1900, p. 262.

Similar to *C. sexguttata*; head scarcely as wide as pronotum, some-

what produced; vertex nearly as long as width between the eyes; front tumid; pronotum as long as vertex, truncate behind.

Velvety black; a white band on the clavus at tip of scutellum, and another across apex of clavus, with a yellowish or whitish spot on costa and another oblique one on apical cells; legs yellowish white. Length: 6 to 7 mm.

Chapada, Brazil, Carn. Mus. Acc. No. 2996 (H. H. Smith *coll.*).

75. *Cicadella lativittata* (Fowler).

Tettigonia lativittata FOWLER, Biol. Cent.-Am., Homopt., II, 1900, p. 281.

Head as wide as pronotum, considerably produced; vertex subangulate; front tumid; clypeus slightly tumid at base, narrowed to tip, pronotum scarcely as long as vertex; hind border truncate, slightly concave. *Genitalia: female*, last ventral segment elongate, strongly carinate, produced on the hind border into an acute angle.

Light yellow; a broad black stripe starting at tip of vertex extends back across pronotum, scutellum, and inner margin of clavus; a stripe beginning at the side of the front extends through the eye across margin of pronotum and along outside of claval suture to the membrane; the propleura black, connecting with a broad costal and discal stripe on the elytra, which has a yellowish submargin for the central part of the corium; apex black, with a triangular whitish spot near apex and a transverse white band across base of apical cells; abdomen above black; base of pygofer infuscate. Length: 5.5 mm.

Las Juntas, Bolivia, Dec., 1913, Carn. Mus. Acc. No. 5066; Quatro Ojos, Bolivia, November, Carn. Mus. Acc. No. 5065 (Steinbach *coll.*).

This is a handsome little species, very similar to *T. oblecta* Fabricius, but smaller and the stripes are yellowish or green and more yellow than blue.

76. *Cicadella satelles* (Fowler).

Tettigonia satelles FOWLER, Biol. Cent.-Am., Homopt., II, 1900, p. 288, pl. XIX, fig. 22.

Head as wide as pronotum, rounded in front; front tumid; pronotum scarcely longer than head.

Black, shiny; vertex margined with yellowish. Pronotum and scutellum black; elytra fuscous or blackish, with a large yellow spot on the clavus; three oblique spots on the costa and a smaller whitish spot at tip of clavus; wings smoky; abdomen black above; beneath together with legs, pale whitish; tarsal claws dusky. Length: 4 mm.

From Provincia del Sara (Steinbach *coll.*). This species was originally described from Mexico, (Tobasco), so that the distribution apparently extends through Central America as far south as Bolivia.

77. *Cicadella quadriplagiata* (Walker).

Tettigonia 4-plagiata WALKER, List Homopt. B. M., pt. 3, 1851, p. 774.

Tettigonia quadriplagiata SIGNORET, Ann. Soc. Ent. Fr. (3) I, 1853, p. 358.

Head broad as pronotum, produced, subangulate; vertex about as long as pronotum. Pronotum broadly arched in front, slightly concave behind; elytra nearly parallel.

Yellow below; above more or less fuscous with a large spot occupying hinder part of vertex and disk of pronotum; a large ovate spot on clavus, and a large triangular spot beyond the middle of costa, light yellow. Abdomen bright red. Length: 6 mm.

Chapada, Brazil, Carn. Mus. Acc. No. 2966 (H. H. Smith coll.); Villa Braga, Brazil, Carn. Mus. Acc. No. 6544 (S. M. Klages coll.); Provincia del Sara, Bolivia (J. Steinbach coll.); Minca, Bonda, Cacaualito, Colombia, Carn. Mus. Acc. No. 1966 (H. H. Smith coll.).

The original description credited this species to the "W. Coast of America," and Signoret records it from "Santafe-de-Bogotá."

78. *Cicadella salutaris* (Fowler).

Tettigonia salutaris FOWLER, Biol. Cent.-Am., Homopt., II, 1900, p. 281, pl. XIX, fig. 4.

Head large, rounded before. Pronotum widened posteriorly; hind border truncate.

Deep velvety black with the head, except two spots on the front border and a wide basal spot, three broad stripes on the pronotum, basal spot at apex of scutellum, a broad stripe on the claval suture and an oblique stripe at base of membrane, bright red; costal border testaceous-yellowish. Beneath testaceous-yellow. Length: 8 to 9 mm.

From Minca, Colombia, July 19, Carn. Mus. Acc. No. 1999 (H. H. Smith coll.).

This species was originally described from Panama.

79. *Cicadella variabilis* (Signoret).

Tettigonia variabilis SIGNORET, Ann. Soc. Ent. Fr. (3) II, 1854, p. 14, pl. I, fig. 14.

Head broad, much wider than pronotum, broadly rounded, slightly subangulate; vertex half longer at middle than next the eye; front tumid; clypeus elevated, subcarinate; pronotum nearly twice as long as vertex; hind border truncate. *Genitalia: female*, last ventral segment long, acuminate, extending about half the length of the pygofer; *male*, plates small, margins rounded, very short, one-fourth the length of the pygofer.

Yellowish below; face, vertex, and pronotum, black, densely maculate with yellow; scutellum black with three large dots on the disk

and a series along the border; elytra greenish or purplish with numerous small maculations. Abdomen red above, with black markings on the segments, yellow below. Length: 7 to 8 mm.

Specimens from Minca, Colombia, Carn. Mus. Acc. No. 1999; Chapada, Brazil, Carn. Mus. Acc. No. 2966 (H. H. Smith *coll.*). Provincia del Sara, 450 m., (Steinbach *coll.*).

Signoret's records are "Colombie," "Cap. de St.-Paul, Bresil." There are specimens in my collection from Coroico Yungas, Bolivia, April, '99.

80. ***Cicadella conjunctula*** sp. nov. Pl. XIII, figs. 28, 28a, 28b.

Head scarcely wider than pronotum, slightly angular, rounded before; vertex convex; ocelli near the hind border; front tumid, slightly flattened on the disk; clypeus a little swollen at the base, narrowed toward tip; apex rounded; pronotum one-half longer than vertex, strongly arched in front, hind border truncate. *Genitalia: female*, last ventral segment long, about twice as long as preceding; hind border sinuate, produced at middle into a sharp tooth; *male*, plates small, acuminate; tips reaching about half-way to end of pygofer.

Orange-yellow; vertex with three black spots, one at the apex and one in front of each ocellus, joined by a distinct black line; ocelli black; pronotum olive-green; anterior border yellowish, tinged with orange; scutellum orange-yellow, a black line more or less distinct across the disk; elytra olive-green, costal border orange-yellow, becoming hyaline toward the tip, apex smoky hyaline; abdomen above reddish-brown, borders yellowish; beneath yellow; legs somewhat testaceous. Length: female 8.25 mm.; male, 8 mm.

Two females (type) and (paratype), two males (allotype) and (paratype) Chapada, Brazil, Carn. Mus. Acc. No. 2966 (H. H. Smith *coll.*). One male (paratype) Santarem (S. M. Klages *coll.*); also one male (paratype) Rio Guaporé below Rio San Miguel, Aug. 22, 1909 (J. D. Haseman *coll.*) and specimens from Las Juntas, Bolivia, Dec., 1913, Carn. Mus. Acc. No. 5066 (Steinbach *coll.*).

81. ***Cicadella cinctosula*** sp. nov. Pl. XIII, figs. 29, 29a.

Head wider than pronotum, short; vertex blunt; ocelli close to the hind border; front somewhat flattened; base of clypeus swollen and punctate; apical part contracted, carinate; tip rounded, margin reflexed; pronotum transversely rugose, with a depressed area bordering the anterior margin; hind angles rounded; hind border scarcely concave. *Genitalia: female*, last ventral segment one-half longer than preceding, emarginate on the hind border, with a strong carina and sharp protruding tooth at the middle.

Purplish brown, somewhat pruinose; elytra brown-black with two conspicuous yellowish bands, one just behind the scutellum, the other extending from costa to claval suture at tip of clavus; also a sub-hyaline yellowish or brown base, costal margin, and band across the antepical cells; apex brownish hyaline; abdomen dull brown; beneath reddish brown; legs with ends of tibiae and tarsi, infusate. Length: 13 mm.

One specimen, female (type) from Hyutanahan, Rio Purús, Brazil, Feb., 1912, Carn. Mus. Acc. No. 6993 (S. M. Klages *coll.*).

This is a very striking species, distinguished by the broad whitish bands on the dark elytra.

82. *Cicadella flammea* (Signoret).

Tettigonia flammea SIGNORET, Ann. Soc. Ent. Fr. (3) III, 1855, p. 50, pl. 6, fig. 2.

Head produced, triangular; vertex sulcate, a little longer than width between the eyes. Pronotum widened behind; hind border concave.

Pale yellow; elytra with orange-brownish border and oblique stripes toward tip; abdomen pale yellow, tinged with orange; legs pale yellow. Length: 11 mm.

Mana River, French Guiana, June 17, Carn. Mus. Acc. No. 6008 (S. M. Klages *coll.*).

83. *Cicadella leucomelas* (Walker).

Tettigonia leucomelas WALKER, List Homopt. B. M., pt. III, 1851, p. 764.

Tettigonia leucomelas SIGNORET, Ann. Soc. Ent. Fr. (3) I, 1853, p. 349, pl. 10, fig. 7.

Black with yellow or ivory markings; head black; hind border white; front black, dotted with white or ivory; sides of cheeks ivory; pronotum black, hind border and a few minute dots on the disks ivory-white; tip of scutellum yellow; elytra dark brown, blackish toward the suture with ivory-yellow spots forming two bands, one just behind the scutellum, the other across the apex of clavus. *Genitalia: female*, last ventral segment strongly produced at the middle; the central part three or four times as long as the preceding segment, blackish; pygofer yellow, the lower margins blackish; *male*, plates short, triangular, finely ciliate on the border, one-third as long as pygofer. Length: female, 5.5 mm.; male, 5 mm.

The Carnegie Museum contains a good series from several localities. Among these may be mentioned two specimens of the female and one male, apparently nearly typical in pattern from Provincia del Sara, Bolivia, 450 m. (J. Steinbach *coll.*); two females from Santos, Brazil (Haseman *coll.*), which differ from the preceding in having the

ivory spots of elytra smaller, the veins dotted with yellow, elytra more reddish-brown; two females and four males from Rio de Janeiro, Brazil, darker than the other specimens, the face nearly all black, the abdomen beneath black, except a narrow border on the segments, elytra dark purplish-brown. All of these specimens differ more or less from the figure given by Signoret, which, however, is apparently somewhat faulty. Signoret stated, however, that this species is extremely variable, so that it seems proper to include all the forms noted here. Previous records give it as common in Brazil, while the specimens noted above extend its range into eastern Bolivia. The Carnegie Museum collection includes also many specimens, one hundred or more, from Chapada, Brazil, November and December, Carn. Mus. Acc. No. 2966 (H. H. Smith *coll.*); Sapucay, Paraguay; San Paulo, Brazil; Cachoeira, Brazil; Bahia, Brazil; Entre Rios, 1908, Carn. Mus. Acc. No. 3579 (J. D. Haseman *coll.*).¹ There are also specimens in my collection from several localities.

84. *Cicadella colorata* (Germar).

Tettigonia colorata GERMAR, Mag. d. Ent., IV, 1821, p. 68.

Tettigonia colorata SIGNORET, Ann. Soc. Ent. Fr. (3) I, 1853, p. 353, pl. 11, fig. 7.

Head as wide as pronotum, subangulate; vertex twice as long at middle as next the eye; front slightly flattened and smooth on the disk; pronotum semicircular before; hind border truncate. *Genitalia: female*, last ventral segment scarcely produced at middle with a broad blunt tooth; *male*, plates narrow, contracted about the middle, two slender spine-like tips reaching nearly to tip of pygofer.

Anterior part of head, including eyes, with a stripe across the border of pronotum and along the base of costa, and the membrane, black; a large ivory-white spot occupying the anterior disk of pronotum and base of vertex, where it is bifid; hind border of pronotum, scutellum, and most of elytra, bright red; an ivory-white band across the elytra at tip of clavus. Beneath, thorax and legs orange-yellow; abdomen red. Length: 8 mm.

Entre Rios, Santos, June, 1908; São Paulo, Brazil; Munez Freire da Cachoeira, Brazil, June 17, 1908, Carn. Mus. Acc. No. 5589 (J. D. Haseman *coll.*).

85. *Cicadella phœnicea* (Signoret).

Tettigonia phœnicea SIGNORET, Ann. Soc. Ent. Fr. (3) I, 1853, p. 353, pl. 10, fig. 16.

Tettigonia elegantula WALKER, List Homopt. B. M., pt. 3, 1851, p. 755.

Similar to *C. colorata*; prothorax ivory-white with a narrow black

margin; scutellum black; elytra sanguineous, with two ivory bands; apex blackish; abdomen and feet, yellow. Length: 8 mm.

Samaipata, Bolivia, elev. 2500 m., Carn. Mus. Acc. No. 6448 (J. Steinbach *coll.*).

Originally described from Brazil, and, so far as I know, no records thus far outside of that region. The specimen in hand differs from Signoret's figure in having the apical band broken, so that it resembles Jacobi's *T. triplicula*, but with only two spots instead of three, on apical part of elytron. These, with *T. colorata* and several other species named by Jacobi, present a group of very closely related forms, the exact relationship of which cannot be determined without fuller series and a better knowledge of distribution and habits.

86. *Cicadella trilineaticeps* (Signoret).

Tettigonia trilineaticeps SIGNORET, Ann. Soc. Ent. Fr. (3) I, 1853, p. 338.

Head broad, as wide as pronotum, rather short, broadly rounded to front; vertex about twice as wide as long; ocelli behind the middle, one-half way from middle line to the eye; front tumid, minutely punctate on the disk, with polished striæ at the sides; clypeus elevated on the middle, narrowed toward the tip; pronotum one-half longer than vertex. *Genitalia: female*, last ventral segment long, nearly three times as long as the preceding segment, the middle part produced, with a shallow sinuation, a deeper notch on each side, forming a short lateral lobe; a faint carina on the disk.

Blue-black above and on the face; vertex with a transverse yellow band, including the ocelli, and extending down the sides of the cheek; a yellow discal stripe on the front; a broad band on each side on the pronotum, extending from the lateral border to the middle line and down upon the pleura; six large yellow spots on the elytra, two on the clavus, the apical one just in front of base of apical cells, transverse; pectus more or less fuscous; legs yellowish tinged with red; abdomen bright red; female segment, except at base, suffused with fuscous. Length: 9 mm.

One female specimen from Rio de Janeiro, Brazil, Carn. Mus. Acc. No. 2966, December (H. H. Smith *coll.*). A male specimen agreeing almost perfectly with this female in color-pattern, but with the stripes and spots of a bright red instead of sulphur-yellow from Rio de Janeiro, Brazil, July, Carn. Mus. Acc. No. 2966 (H. H. Smith *coll.*) in which the male valve is hidden; plates broad at base, convexly narrowed to the middle, and extended as slender acute upturned points, reaching one-half way to tip of pygofer.

The color-pattern of these two specimens is so perfectly similar that it would seem certain that they must belong to the same species, although the difference in the color is very pronounced.

87. *Cicadella sulfureoguttata* sp. nov.

Head wider than pronotum, short; vertex about one-half as long as wide, broadly rounded in front; vertex slightly depressed on the disk; ocelli on the hind border; front with polished striæ at the sides; clypeus tumid, slightly angulate; apex contracted; cheeks narrow; pronotum twice as long as vertex. *Genitalia: female*, last ventral segment twice as long as preceding; narrowed behind; apex sinuate, forming a small central lobe.

Above blue-black, slightly pruinose; a broad band across the vertex including the ocelli, a broad band on pronotum interrupted at middle and extending down upon the pleura to the base of anterior coxæ, five large spots on each elytron, two on clavus, one at base and one two-thirds way to tip, three on corium, the two outer ones transverse, bright lemon-yellow; face black, with a large central elongate spot on front, the inner part of cheeks paler; pectus pale yellowish; abdomen above and beneath bright red; legs tinged with red; the tarsi and ovipositor blackish. Length: 10 mm.

One female specimen (type) Rio de Janeiro, Brazil, Sept. 10, 1912, Carn. Mus. Acc. No. 4770 (W. J. Holland coll.).

This species is very similar to *trilineaticeps* and belongs with the group of *elegantissima* and *12-punctata*, as it has a short vertex and the pattern of the spots is similar, but the color is quite different, so that it seems out of place in either species.

It is possible that several of these species may ultimately prove to be sports or color-variations from a single species.

88. *Cicadella crocipennis* (Signoret).

Tettigonia crocipennis SIGNORET, Ann. Soc. Ent. Fr. (3) I, 1853, p. 351.

Tettigonia crocipennis STÅL, Rio. Hemipt., p. 40.

Genitalia: female, last ventral segment about three times as long as preceding; sides nearly parallel, hind border thickened, emarginate; surface with irregular elevations or ridged.

Black, with elytra bright red to the end of the clavus; apex black; beneath dusky; legs dark brown or fuscous, hind margins whitish. Length: female, 9.5 mm.

One specimen, Aguaquente, São Paulo, Brazil, Nov., 1908, Carn. Mus. Acc. No. 3763 (J. D. Haseman coll.). I have also one from San Leopoldo, Brazil.

This species was described by Signoret from Brazil and is also reported by Stål from Rio de Janeiro.

89. *Cicadella bifasciata* (Fabricius).

Cicada 2-fasciata FABRICIUS, Syst. Rhyng., 1803, p. 70.—BURMEISTER, Handb. d. Ent., II, 1, 1835, p. 117.

Tettigonia bicincta GERMAR, Mag. d. Ent. IV, 1821, p. 66.

Tettigonia bifasciata SIGNORET, Ann. Soc. Ent. Fr. (3) I, 1853, p. 329, pl. 8, fig. 6.
—STÅL, Hemipt. Fabric., II, 1869, p. 72.

Head wider than pronotum, broadly arched, short; vertex with margins nearly parallel; ocelli close to the base, twice as far from each other as from eye; front flattened; clypeus much elevated at base, contracted, broadly carinate and rounded at tip; pronotum twice as long as vertex; hind border broadly sinuate. *Genitalia: female*, last ventral segment which is nearly twice as long as the preceding segment, produced on the middle into a long blunt tooth, about one-half as long as the segment at the sides; *male*, with a distinct triangular valve; hind border rounded; plates rather narrow, carinate; tips elongate, acute, reaching tip of pygofer.

Light testaceous; ocelli fuscous or blackish; a small black spot at tip of vertex; hind border of pronotum a little yellower; elytra bright purplish or blackish, with two bands, one just back of the scutellum, the other at tip of clavus. Abdomen red-brown; legs testaceous, darker toward tips. Length: 11 to 12 mm.

Represented by a male specimen, somewhat lighter colored than the average form, from the Mana River, French Guiana, March, 1917, Carn. Mus. Acc. No. 6008; and by specimens from Pied Saut, French Guiana, Carn. Mus. Acc. No. 6173 (S. M. Klages coll.).

I also have specimens, one female and two males, from Bartica, British Guiana, collected May, 1901, by H. S. Parish.

These specimens are slightly smaller than indicated by Signoret, but otherwise agree with his description, especially of the valve of the male.

90. *Cicadella unifasciata* (Fabricius).

Cicada unifasciata FABRICIUS, Syst. Rhyng., 1803, p. 72.

Tettigonia unifasciata SIGNORET, Ann. Soc. Ent. Fr., (3) I, 1853, p. 328.—STÅL, Hemipt. Fabric., II, 1869, p. 72.

Smaller than *C. bifasciata* and with a single bluish-white band near the tip of the elytra, and some scattered bluish spots at the base. Length: 9 mm.

The single specimen representing this species is smaller than stated by Signoret, but agrees very perfectly in other details. It is from Mana River, French Guiana, June, 1917, Carn. Mus. Acc. No. 6008 (S. M. Klages coll.).

91. *Cicadella aurulenta* (Fabricius).

Cicada aurulenta FABRICIUS, Mant. Ins., II, 1787, p. 269; Ent. Syst. IV, 1794, p. 33; Syst. Rhyng., 1803, p. 71.—COQUEBERT, Ill. Ins., II, 1801, p. 79, pl. XVIII, fig. 13.

Tettigonia aurulenta SIGNORET, Ann. Soc. Ent. Fr. (3) I, 1853, p. 325.

Head broad, distinctly wider than pronotum, broadly rounded, slightly longer at middle than next the eyes; front tumid, rounded; clypeus elevated, carinate, narrowed to tip; pronotum nearly twice as long as vertex; hind border faintly concave. *Genitalia: female*, last ventral segment elongate, produced at middle into a broad tooth; *male*, last ventral segment as long as preceding, slightly sinuate; plates triangular, acute, slightly upturned, nearly as long as pygofer, with numerous short spines on the disk, and dense pilose fringe on margin.

Dull yellow or orange-yellow, sometimes tinged with brown; vertex with an irregular transverse fascia just back of the black ocelli; a black point at tip of vertex, sometimes star-shaped; pronotum with a rather distinct dark puncture behind ocellus; posterior part irrorate with fuscous; scutellum with a fuscous patch just in front of the transverse furrow; elytra purplish-brown, more or less irrorate with greenish or bluish; abdomen above brilliant coral-red; beneath reddish or yellow. Length: 10 mm.

Represented by specimens from Mana River, French Guiana, June, 1917, Carn. Mus. Acc. No. 6008 (S. M. Klages *coll.*); Provincia del Sara, Bolivia, 450 m., Carn. Mus. Acc. No. 6443 (J. Steinbach *coll.*); Rio de Janeiro and Corumbá, Brazil, Carn. Mus. Acc. No. 2966 (H. H. Smith *coll.*).

The author's collection includes numerous specimens from Bartica, British Guiana, and one specimen from "Corumbá, Matto Grosso," Brazil.

92. *Cicadella pulchra* (Fabricius).

Cicada pulchra FABRICIUS, Syst. Rhyng., 1803, p. 69.

Tettigonia pulchra SIGNORET, Ann. Soc. Ent. Fr. (3) I, 1853, p. 326, pl. 8, fig. 3.

This species is more robust than *C. aurulenta* and has a different picture on the elytra.

One female from Upper Rocana, Pará, Brazil (S. M. Klages *coll.*) agrees perfectly with Signoret's description and figure; another specimen, male, agrees quite closely, but differs somewhat in color-pattern and is placed here with some doubt. It is from Nova Olinda, Rio Purús, Brazil, June, 1922, Carn. Mus. Acc. No. 6962 (S. M. Klages *coll.*).

93. *Cicadella purpurata* (Germar).

Tettigonia purpurata GERMAR, Mag. d. Ent., IV, 1821, p. 63, pl. 8, fig. 2.

Tettigonia purpurata SIGNORET, Ann. Soc. Ent. Fr. (3) I, 1853, p. 325.

Somewhat smaller and slenderer than *C. pulchra*, with the color-pattern broken, so as to form transverse bands.

The single specimen that I have referred to this species is of a darker purple than shown in Signoret's figure, and there is indication of an additional band near base of elytra. It is a male 9 mm. in length and is labelled Benevides, Pará, Brazil, October, 1918, Carn. Mus. Acc. No. 6174 (S. M. Klages coll.).

94. *Cicadella fastuosa* (Fabricius).

Cicada fastuosa FABRICIUS, Syst. Rhyng., 1803, p. 70.

Tettigonia fastuosa SIGNORET, Ann. Soc. Ent. Fr. (3) I, 1853, p. 37.—STÅL, Hemipt. Fabric., II, 1869, p. 73.

Head broad, much wider than pronotum, rounded in front; vertex scarcely longer at middle than next the eyes; front tumid; clypeus tumid at base, contracted at tip; pronotum with sides nearly parallel; anterior border strongly arched; hind border faintly emarginate; scutellum acuminate. *Genitalia: female*, last ventral segment nearly twice as long as preceding; hind border truncate or slightly sinuate.

Bright yellow and brown; vertex brown with a broad transverse band just in front of ocelli; front with a broad band at base; below with clypeus brown; eyes brown; ocelli black; pronotum brown with a broad yellow band; scutellum brown with a yellow band near the tip; elytra brown with broad orange band at base and on the clavus; a discal orange-yellow spot with a yellowish streak near the costa; a broad transverse orange band beyond the tip of clavus; the apex smoky hyaline; beneath mostly bright yellow; base of pygofer and ovipositor brown or fuscous; abdomen above yellow; legs yellow, testaceous toward tips; tarsal claws dusky. Length: 11 to 12 mm.

Pied Saut, Oyapok River, French Guiana, Carn. Mus. Acc. No. 6173 (S. M. Klages coll.).

There is a specimen in my collection from Bartica, British Guiana, and Signoret's record is from "Cayenne," while the original description gives "*Am. meridionalis*." Very likely this refers to the Guiana region, so the distribution would be limited to the northern border of South America.

95. *Cicadella signatula* sp. nov. Pl. XIII, figs. 26, 26a, 26b.

Head as wide as pronotum, distinctly produced; vertex nearly as long as width between the eyes; front tumid; clypeus tumid at base,

subangulate; apex contracted; pronotum slightly longer than vertex, widened slightly behind; hind border sinuate. *Genitalia: female*, last ventral segment long, nearly three times as long as preceding; hind border slightly convex, a little produced at middle; *male*, last segment broad; plates triangular, with slender acute upturned tips reaching three-fourths the length of the pygofer.

Yellow tinged with orange; vertex with a broad cross of black; the anterior central part broadly triangular, and middle line extended forward to connect with an apical spot; the lateral arms connecting with a black patch in front of the eyes, which fuses with the lateral stripe on the front, these stripes fusing at apex of front and with the black clypeus, but in some cases the connection is broken; pronotum at base olive-green, with two large transverse black spots; scutellum yellow or greenish, with large basal spots in the angles and the transverse spot behind the suture, black; elytra dark olive-green; the costa more or less yellowish and subhyaline toward the tip; apex narrowly black with a submargin of yellowish. Beneath yellow, tinged with orange; pectus black; abdomen above dusky, with borders of red. Length: 7 mm.

Four specimens, three females (type and paratypes) and one male (allotype), Provincia del Sara, Bolivia, Carn. Mus. Acc. Nos. 5066 and 6443 (J. Steinbach *coll.*).

96. *Cicadella contaminata* (Fabricius).

Cicada contaminata FABRICIUS, Syst. Rhyng., 1803, p. 72.

Tettigonia variabilis SIGNORET, Ann. Soc. Ent. Fr. (3) II, 1854, p. 14, pl. I, fig. 14.

Tettigonia contaminata STÅL, Hemipt. Fabric., II, 1869, p. 73.

Head wider than pronotum; vertex rounded, slightly longer at middle than next the eye; front slightly flattened; clypeus, loræ, and cheeks narrow; pronotum strongly arched in front; lateral borders and angles broadly rounded; scutellum rather small. *Genitalia: female*, last ventral segment rounding; lateral angles much produced; hind border broadly concave; length at middle a little more than one-half the lateral angles; *male*, valve very short; plates broad at base, narrowed to middle and somewhat thickened, conical and extended into slender acute tips nearly as long as pygofer; sides of pygofer carinate.

Dark green; anterior part of vertex and sides of front with transverse alternating yellow and black bars; hind part of vertex with yellow or green; pronotum irrorate with green and black; scutellum with distinct black spots on base; elytra dark green, maculate with fuscous; beneath dull yellowish or brownish; legs somewhat infusate; abdomen orange-yellow beneath. Length: female, 8 mm.; male, 6.5 to 7 mm.

Specimens from Santos, Brazil, Carn. Mus. Acc. No. 3702 (J. D.

Haseman *coll.*); from Rio de Janeiro and Chapada, Brazil, Carn. Mus. Acc. No. 2966 (H. H. Smith *coll.*).

This is a quite variable species, and the males are lighter colored below than the females.

97. *Cicadella dubia* (Signoret).

Tettigonia dubia SIGNORET, Ann. Soc. Ent. Fr. (3) I, 1853, p. 343, pl. 9, fig. 11.

Head broad, considerably wider than pronotum, short, strongly arched; vertex slightly longer at middle than next the eyes; front convex; clypeus obtusely angulate in profile, carinate; apex rounded, border reflexed; cheeks narrow; pronotum strongly arched in front; lateral border very short, hind border convex. *Genitalia: female*, last ventral segment produced into a long, median spine, nearly one-half the length of the ovipositor.

Dark brown; the face, vertex, pronotum, and scutellum with numerous rounded or yellow spots; elytra maculate with dark brown and green; abdomen black above bordered with red, beneath pale yellow; legs pale yellow; tarsi fuscous. Length: 6.5 mm.

Specimens from "Bom Jardim, Minas Geraes, Brazil, July, 1908, Carn. Mus. Acc. No. 3702 (J. D. Haseman *coll.*).

This species is particularly marked by the long spine-like extension of the female segment. What is evidently the male of this species is somewhat darker, the yellow spots apparently less numerous; the male valve wanting; plates very short, triangular, about one-fourth the length of the pygofer which is somewhat tumid. Of this I have before me one specimen from Entre Rios, Brazil, June, 1908, Carn. Mus. Acc. No. 3564 (J. D. Haseman *coll.*).

98. *Cicadella sagata* (Signoret).

Tettigonia sagata SIGNORET, Ann. Soc. Ent. Fr. (3) II, 1854, p. 27, pl. 2, fig. 15.—
STÅL, Rio Hemiptera, 1862, p. 42.—BERG, Hemiptera Argentina, 1879, p. 254.

Genitalia: female, last ventral segment twice as long as preceding, sides parallel, hind border deeply sinuous forming a central blunt tooth; *male*, valve small; plates short, narrowing abruptly, and extended into slender tips reaching nearly to the tip of the pygofer.

Yellowish-white, with two broad black stripes united at the tip of the head, extending back over pronotum and scutellum, and covering inner part of clavus; elytra with broad green stripes on outer part of clavus and near the costa; middle of scutellum yellow; apex of elytra blackish with a whitish costal area, and a white spot near the tip; abdomen black, white beneath; tarsi blackish. Length: male, 5 mm.

Two specimens, males, from Santos, Brazil, July 26, 1906, Carn.

Mus. Acc. No. 3702 (J. D. Haseman *coll.*). Dr. M. S. Pennington has sent me a female specimen from Buenos Aires, whence it was recorded by Berg. The species occurs from Mexico to Buenos Aires.

99. *Cicadella flavovittata* (Stål).

Tettigonia flavovittata STÅL, Rio Hemipt., 1862, p. 42.

Similar to *sagata*, but the black stripes do not meet at tip of head; the body whitish; pronotum with a central and lateral whitish stripe; scutellum whitish at middle; elytra black, with a broad yellowish stripe from base narrowing to line along the outer border of clavus, and a whitish sub-costal stripe extending from before the middle to near the tip.

One specimen, the hinder part of which is mutilated, from Rio de Janeiro, Brazil, Carn. Mus. Acc. No. 2966 (H. H. Smith *coll.*).

100. *Cicadella sertigerula* (Jacobi).

Tettigoniella sertigerula JACOBI, Sitzb. Ges. Nat. Fr. Berl., 1905, p. 180.

Genitalia: male, valve hidden, plates short, narrowed abruptly, apex with an elongate process reaching nearly to tip of pygofer; *female*, last ventral segment truncate or slightly concave.

Black, with a white transverse band across the vertex and in front of eyes, also three yellowish-green bands: the first, across base of pronotum; the second, across elytra at apex of scutellum; and the third, which is somewhat expanded at the middle, across the elytra on apex of clavus. An oblique whitish or greenish yellow fascia before the apex and a narrow apical border, whitish. Beneath black, beak and legs whitish; tarsal claws black. Length: 4 mm.

A number of specimens from Las Juntas, Bolivia, December, 1913, Carn. Mus. Acc. No. 5066 (J. Steinbach *coll.*). There is also a specimen in the author's collection from Mapiri, Bolivia.

101. *Cicadella sanguineovittata* (Signoret).

Tettigonia sanguineovittata SIGNORET, Ann. Soc. Ent. Fr. (3) III, 1855, p. 777, pl. 23, fig. 14.

Head broad, rounded in front; vertex slightly flattened; front tumid; clypeus narrowed to tip; pronotum one-third longer than vertex. *Genitalia: female*, last ventral segment twice as long as preceding, somewhat narrowed posteriorly; hind border slightly produced, with two minute tooth-like projections on the hind border near the center; *male*, plates abruptly constricted before the middle, apical part attenuate; tips acute, almost spine-like, extending two-thirds the length of the pygofer.

Light yellow, tinged with orange; vertex with two broad fuscous or blackish stripes, which extend as narrow lines down upon the front, and are continued as widening stripes across the pronotum and outer angles of the scutellum; also a brown or blackish stripe at the lateral border; the elytra are yellowish at base, reddish on the disk of the corium with a broad fuscous or blackish stripe, occupying a large part of the area; membrane smoky; wings blackish; beneath yellowish, tinged with orange; abdomen with borders reddish. Length: 5 mm.

Four specimens, two females, two males. Two males and one female from Provincia del Sara, Bolivia, April, 1913, Carn. Mus. Acc. No. 5064 (Steinbach *coll.*); one female, Rio de Janeiro, Brazil, October, Carn. Mus. Acc. No. 2966 (H. H. Smith *coll.*).

102. **Cicadella corrugipennis** sp. nov. Pl. XIV, fig. 45, 45a.

Head scarcely as wide as pronotum, rounded in front; vertex short, about one-half longer at middle than next the eye; ocelli near the hind border; front somewhat flattened on the disk; clypeus narrowed to tip; pronotum nearly twice longer than the vertex; hind border convex, or subtruncate; elytra with conspicuous corrugations, one on the clavus, and two on the corium, extending nearly to apex. *Genitalia: female*, last ventral segment elongate, twice as long as preceding; lateral angles rounded; posterior border produced; *male*, plates broad at base, narrowed abruptly before the middle with long attenuate slightly upturned tips, reaching three-fourths length of the pygofer.

Black; posterior part of vertex, the posterior part of pronotum, except extreme border, a broad elevated stripe on clavus and two broad stripes on the corium covering the elevated corrugations, dark red; lower part of face whitish, suffused with testaceous; legs whitish; apex of femora and the tibiæ suffused with reddish; the disk of corium and apical membrane, smoky hyaline; the veins fuscous, or at tip reddish. Length: female, 4.5 mm.; male, 4.25 mm.

Described from six specimens, five females (type and paratypes), and one male, (allotype); females from Provincia del Sara, Bolivia, 450 m., Carn. Mus. Acc. No. 5064; male, Las Juntas, Bolivia, Dec., 1913, Carn. Mus. Acc. No. 5066 (J. Steinbach *coll.*).

This is a small species, having somewhat the general appearance of *C. ignicolor* or *C. cruenta*, but much smaller and especially characterized by the corrugations of the elytra.

103. **Cicadella hectica** (Signoret). Pl. XVI, figs. 66, 66a, 66b.

Tettigonia hectica SIGNORET, Ann. Soc. Ent. Fr. (3) II, 1854, p. 20, pl. 2, fig. 6.

Head about as wide as pronotum, produced, subangulate; vertex scarcely as long at middle as between eyes; ocelli near the hind

border; front tumid; disk flattened; clypeus slightly thickened at base, subcarinate, contracted at tip; pronotum strongly arched in front, widening behind, hind border sinuate. *Genitalia: female*, last ventral segment long, about three times as long as preceding; hind border produced, narrowed to near the middle and lightly sinuate on each side of a blunt median tooth; *male*, plates broad at base, narrowed to middle, beyond which they are narrow, compressed, with finely ciliate appendages reaching beyond the tip of the pygofer.

Pale orange; base of vertex and anterior border of pronotum and scutellum, light yellow; disk of pronotum and elytra to end of clavus dark green; two spots on disk of vertex, two near anterior border of pronotum, two angular ones on base of scutellum, black; two fuscous spots on disk of scutellum; costal border of elytra orange; a patch on the apex reddish; membrane smoky hyaline; wings milky hyaline with fuscous nerves; abdomen above tinged with red; tarsi conspicuously tipped with blackish or dark fuscous. Length: female, 6.5 mm; male, 6 mm.

Redescribed from a series of specimens from Rio de Janeiro, Brazil, May, July, and August, Carn. Mus. Acc. No. 2966 (H. H. Smith *coll.*) and Santos, Brazil, July 26, 1908, Carn. Mus. Acc. No. 3702 (J. D. Haseman *coll.*). It is a conspicuous little species, with brilliant orange below, and mostly dark green above, while the black tipped tarsi contrast strongly with the other parts.

104. ***Cicadella cuneatula*** sp. nov. Pl. XVI, figs. 63, 63a.

Head slightly wider than pronotum, subconical and angulate before; vertex convex, scarcely as long as width between the eyes; ocelli on a line between the fore margins of the eyes; front tumid, the lower part slightly concave; base of clypeus elevated, apex contracted; pronotum a little longer than vertex, sides nearly parallel; hind border truncate; scutellum rather small. *Genitalia: female*, last ventral segment long, nearly twice as long as preceding; hind border broadly rounded; *male*, last ventral segment as long as preceding; hind border truncate; plates small, triangular; tips acute, extending nearly to tip of the short pygofer.

Pale yellow, probably greenish in life; vertex and anterior border of pronotum minutely inscribed with very delicate dots and lines; front with very narrow blackish arcs on the upper part, disappearing below; elytra subhyaline, more or less definitely suffused with golden yellow; beneath whitish; tips of tarsi dusky. Length: female, 7 mm; male, 5.5 mm.

Described from a large series of specimens, including eight females, twelve males (type, allotype and paratypes); ten from S. Antonio de Guaporé, Brazil, July 26, 1909, Carn. Mus. Acc. No. 4043 (J. D. Haseman *coll.*); nine specimens from Rio Guaporé, Brazil, near Fort

Principe, Aug. 25, 1908, Carn. Mus. Acc. No. 4043 (Haseman *coll.*); one specimen from S. Joaquin, Bolivia, Aug. 21, 1909, Carn. Mus. Acc. No. 4018 (Haseman *coll.*).

I have also a single specimen sent to me by Dr. M. S. Pennington, Buenos Aires, Argentina, which only differs in being bright green on the posterior part of pronotum and elytra, and in the more distinct black lines and dots of vertex and pronotum.

This species is remarkably like *T. similis* (Walker) in the color and markings, but is uniformly much larger, and is differently colored below, lacking the black markings common to that species. It seems hardly possible that it can be a variety, considering the difference in size.

105. *Cicadella corallina* sp. nov. Pl. XIII, figs. 31, 31a.

Head large, as wide as pronotum, somewhat produced, rounded in front; ocelli on a line between anterior border of eyes; front convex, slightly flattened on the disk; clypeus tumid at base, contracted at tip; pronotum about half longer than vertex, faintly concave behind. *Genitalia: male*, last ventral segment equal to preceding; plates narrow, together about one-half as wide as the last segment, narrowing close to the base, and extended as long slender thickened tips nearly to tip of pygofer.

Orange-yellow; the ocelli and the large oval spot at tip of vertex black; scutellum yellow, with a fuscous spot on the anterior border and a broader one on the disk near the posterior border; scutellum and most of elytra to the sub-hyaline apex, dark coral-red with large yellow spots, one occupying most of basal half of the clavus, and connected with one on the corium just below the pale suture, a smaller one half-way to tip of clavus and a broad one occupying inner half of corium and extreme tip of clavus; membrane smoky; beneath orange-yellow, the abdomen above dark coral-red. Length: 9 mm.

Described from one specimen Provincia del Sara, Bolivia, Carn. Mus. Acc. No. 5064 (Steinbach *coll.*).

106. *Cicadella pendulosa* sp. nov. Pl. XI, figs. 6, 6a, 6b.

Head slightly wider than pronotum, broadly rounded in front; vertex nearly twice as wide between the eyes as length at middle; front slightly flattened on the disk; clypeus tumid at base, narrowed to the rounded tip; pronotum half longer than vertex; lateral margins short, postero-lateral angle broadly rounded; hind border faintly concave. *Genitalia: female*, last ventral segment long; lateral angles produced; posterior border faintly sinuate and emarginate; the disk with a prominent ridge on either side; *male*, last ventral segment

truncate; plates narrow, somewhat thickened, narrowing into attenuate, upturned, acute tips, reaching two-thirds length of the large, elongate pygofer.

Orange-yellow; vertex with a large central black spot, from which a slender line usually connects with the black apical spot; ocelli black; pronotum yellow, with a central fuscous patch, shading to brown on the posterior border; scutellum brown; elytra mostly coral-red with ivory-yellow or whitish spots, one of which covers the base and sutural part of clavus, another lying against the claval suture on the corium and a large ovate or elliptical spot on corium, extending to cross-veins or the smoky subhyaline membrane; beneath orange; abdomen above bright orange-red. Length: female, 6.5 mm.; male, 6 mm.

Described from fourteen specimens, five females (type and paratypes) and three males (allotype and paratypes) from S. Antonio de Guaporé, Brazil, July 26, 1909; one female and one male (paratypes) from Rio Guaporé, near Fort Principe; and four specimens, three females and one male (paratypes) from Rio Machupo, near Rio Guaporé, Aug. 25, 1909, Carn. Mus. Acc. No. 4043 (J. D. Haseman *coll.*).

This is a quite striking species and does not agree with any of the described species known to me.

107. *Cicadella jucunda* (Walker).

Tettigonia jucunda WALKER, List Homopt. B. M., pt. III, 1851, p. 757.—SIGNORET, Ann. Soc. Ent. Fr. (3) I, 1853, p. 355, pl. 11, fig. 5.

Genitalia: male, plates narrow, acuminate, thickened apically, extending about three-fourths the length of the broad robust pygofer; base of vertex, marginal line and apical spot, the eyes, a broad border on the pronotum, extending forward on the disks, the costa and transverse bands and apical membrane of elytra, black.

Somewhat similar to *C. pulchella*, but of a brighter scarlet-red and with the female segment deeply excavated, the lateral angles extended about twice as long as the median portion, and the central part of base elevated, and with a broad notch up the center. Length: 8 mm.

Our specimens are from San Pedro and Las Amates, Guatemala, collected by Prof. J. S. Hine, February, 1905. It has been recorded from numerous localities in Mexico and the Central American states.

108. *Cicadella pulchella* (Guerin).

Tettigonia pulchella GUERIN, Iconogr. du Regne Anim., Ins. (1829-1844) p. 369, pl. 59, fig. 10.—WALKER, List Homopt. B. M., pt. III, 1851, p. 736.—SIGNORET, Ann. Soc. Ent. Fr. (3) I, 1853, p. 360, pl. 11, fig. 11.

Tettigonia proxima SIGNORET, *l. c.*, p. 361, pl. 11, fig. 12.

Genitalia: male, plates tumid at base, narrowing to the middle and

extended as thick acute upturned tips, the lateral margin and apical half whitish.

Marked with black and white; the posterior part of pronotum and the elytra mostly dark red; apex of vertex and middle stripe on front, white; posterior part of head including ocelli, sides of front and margin of cheek, broadly white; eyes black; ocelli dusky; anterior margin of pronotum, scutellum, except the center, a triangular spot on the clavus, discal spot and transverse bar and the membrane of elytra, black; a discal spot on the posterior disk of pronotum, and the elytra, except the irregular white bands which are more or less bordered with black, a rather deep purplish red or red-brown; beneath black, abdominal segments broadly margined with white; last ventral segment of female elongate, strongly carinate, brownish, with large whitish spots on the posterior part; pygofers margined with whitish. Length: 8 mm.

This appears to be a very common species in Central America, and specimens are in the author's collection from the Canal Zone, Chiriqui, Panama, Santa Lucia, and Guatemala. It is recorded from many localities in Mexico and Central America in the *Biologia Centrali-Americana*.

The species is subject to much variation and Signoret has indicated a form called *proxima*, which Fowler connects with *pulchella*, as a separate species. Our specimens include forms, which have the front broadly fulvous and narrowly white, and the males have the front much more tumid than the females.

109. *Cicadella mæsta* (Fabricius).

Cicada mæsta FABRICIUS, Syst. Rhyng., 1803, p. 74.

Tettigonia mæsta SIGNORET, Ann. Soc. Ent. Fr. (3) III, 1855, p. 777, pl. 23, fig. 13.

—STÅL, Hemipt. Fabric., II, 1869, p. 75.

Head broad, rather short, rounded in front; clypeus somewhat rugose. *Genitalia: female*, last ventral segment nearly twice as long as preceding, the hind border thickened and produced on the median part; *male*, valve hidden; plates narrow, pointed, extending about half the length of the pygofer.

The front of vertex, the front, except lateral margin, center of base and apex of clypeus, anterior half of pronotum, base of scutellum and oblique bands bordering the white arcs of the elytra, tips of elytra, tips of tibiæ and the tarsal claws, black, or dark fuscous; hinder part of vertex, including ocelli, posterior and lateral part of pronotum, a broad curved stripe on the elytra, beginning at scutellum and extending to costa and back to tip of clavus, and an apical spot near the apex on costa, pearly bluish-white; apex of scutellum, base

and saddle of elytra, brown; beneath yellowish; dorsum of abdomen reddish. Length: female, 5.5 mm.; male, 5 mm.

Las Juntas and Quatro Ojos, Bolivia, Carn. Mus. Acc. No. 5065 (Steinbach *coll.*); specimens in the author's collection from Bartica, British Guiana, March 20 to 30, April 18, May 6, Aug. 10, 1901 (H. S. Parish *coll.*).

The original record is "*America meridionalis.*"

110. *Cicadella occatoria* (Say).

Tettigonia occatoria SAY, Jour. Acad. Nat. Sci. Phila., VI, 1831, p. 311; Complete Writings, Vol. II, p. 385.—SIGNORET, Ann. Soc. Ent. Fr. (3) II, 1854, p. 353.—FOWLER, Biol. Cent.-Am., Homopt., II, 1900, p. 279.

Tettigonia compta FOWLER, *l. c.*, p. 271.

Cicadella occatoria VANDUZEE, Catalog Hemipt., 1917, p. 598.

A bright greenish or sometimes yellowish or pinkish species, with black stripes converging at tip of vertex. Length: 5–6 mm.

Fowler describes as "variety *a*" the light pinkish form, which is occasionally met in collections from various regions, but these may be seasonal or ecologic forms, rather than established varieties.

The Carnegie Museum possesses specimens from Minca, Colombia, Carn. Mus. Acc. No. 1999, and Chapada, Brazil, Carn. Mus. Acc. No. 2966 (H. H. Smith *coll.*).

Our collections embrace records from Guatemala (J. S. Hine *coll.*) and from Florida, Mississippi, and Alabama in the southern United States, so that the range extends from the Gulf States to central South America. Fowler's *T. compta* is evidently a color-variety, as indicated by VanDuzee. Our collections include both forms from Florida, as well as from Central and South American localities.

As there does not seem to have been any northward distribution in the century since the species was described by Say, it may be considered as limited to tropical and subtropical regions, but within these limits it must be at times of considerable economic importance, as it is collected in immense numbers from grasses or low herbage.

111. *Cicadella olivatula* sp. nov. Pl. XVI, figs. 59, 59a.

Head slightly wider than pronotum, vertex angulate with a faintly reflexed margin, front tumid, slightly flattened on the disk; clypeus tumid at base, contracted at tip; pronotum nearly twice as long as vertex. *Genitalia*: *male*, valve very small; plates broad, nearly parallel to beyond the middle, suddenly contracted and then expanded, the apical part folded within pygofer.

Head, anterior border of pronotum, scutellum, and margins of elytra,

tawny; disk of pronotum and most of elytra olive-green; vertex with a black dot at apex, beneath more yellowish.

Four specimens from Archidona, Ecuador, in the author's collection under the name *Tettigonia olivatula* Breddin. This may be a manuscript-name, as I do not find any reference to such a species in the literature.

112. *Cicadella lutea* (Signoret).

Tettigonia lutea, SIGNORET, Ann. Soc. Ent. Fr. (3) III, 1855, p. 773.—FOWLER, Biol. Cent.-Am., Homopt., II, 1900, p. 267, pl. XVIII, fig. 1.

Genitalia: female, last ventral segment elongate, convex, hind border produced at the middle, sinuate at the sides.

Light yellow; base of pronotum and elytra light olive-green; vertex with a discal black spot and a minute black dot at apex; pronotum with a black spot on the center of the disk; scutellum yellow; beneath entirely yellow, except ovipositor and tarsal claws, which are blackish.

A single specimen, referred to this species, is from E. (Espírito) Santo, Brazil, July 29, 1908, Carn. Mus. Acc. No. 3767 (J. D. Haseman *coll.*).

The species was originally described from Guatemala.

113. *Cicadella reservata* (Fowler).

Tettigonia reservata FOWLER, Biol. Cent.-Am., Homopt., II, 1900, p. 267, pl. XVIII, fig. 2.

Genitalia: female, last ventral segment elongate, slightly produced and bordered with fuscous at the middle; *male*, valve short, rounded behind, plates short, acute, sparsely setose.

A small greenish species, superficially resembling *C. similis*, but without the intricate markings of the vertex; vertex yellow, with a black apical point, a central black line or spot; ocelli black; pronotum mostly green, more or less yellow on the anterior border; scutellum yellowish; beneath pale yellow.

Specimens from Minca, Colombia, Carn. Mus. Acc. No. 1999 (H. H. Smith *coll.*); Quatro Ojos, Bolivia, November, 1913; Las Juntas, Bolivia, December, 1913, Carn. Mus. Acc. No. 5065 (Steinbach *coll.*); Rio Machupo, near Rio Guaporé, and Villa Bella, Bolivia, Carn. Mus. Acc. No. 4043 (Haseman *coll.*).

114. *Cicadella ventralis* (Signoret). Pl. XVI, figs. 60, 60a.

Tettigonia ventralis SIGNORET, Ann. Soc. Ent. Fr. (3) II, 1854, p. 21, pl. 5, fig. 8.

Head scarcely wider than pronotum; vertex about as long as width

between the eyes and nearly the length of the pronotum; elytra narrow, nearly parallel, extending beyond end of abdomen.

Dull yellow or greenish yellow; vertex with a black spot on the disk and a minute dot at apex; anterior border of pronotum and the scutellum, yellow; disk of pronotum and the elytra, mostly greenish; abdomen and legs yellow. Length: 6 mm.

The species was described from Colombia and Brazil and I have specimens from Archidona, Ecuador. As indicated by Signoret, the species is readily separated from *C. cæruleovittata*, to which it is nearly related, by the longer vertex and different shape of pronotum as well as details of coloration.

115. *Cicadella limbatula* (Germar). Pl. XIII, figs. 32, 32a.

Head rounded, faintly angulate; vertex convex, subangulate to front. *Genitalia: male*, valve wanting; plates short with slender tips reaching half-way to end of pygofer.

Above olive-green, with border of vertex indented; anterior border of pronotum, scutellum, except central dot, costal and claval margin of elytra, orange-red; face dull whitish, with margins of front and clypeus black; pectus black; legs and abdomen below yellow or yellowish white.

Specimens in the Carnegie Museum, collected by Haseman, from S. Antonio de Guaporé, Brazil, July 26, 1909, and Rio Guaporé, near Porto Principe, Brazil, Aug. 25, 1909, Carn. Mus. Acc. No. 4043.

I have only seen males. Specimens from Archidona, Brazil, are in the author's collection.

116. *Cicadella cæruleovittata* (Signoret).

Tettigonia lineata SIGNORET, Ann. Soc. Ent. Fr. (3) II, 1854, p. 21, pl. 2, fig. 9
(*nec T. lineata* Fabricius, Syst. Rhyng., p. 66).

Tettigonia cæruleovittata SIGNORET, Ann. Soc. Ent. Fr. (3) III, 1855, p. 821 (Table des Tettigonides: correction of synonymy)—FOWLER, Biol. Cent.-Am., Homopt., II, 1900, p. 277.

Genitalia: female, last ventral segment produced, notched at the sides forming three rather blunt teeth, the middle of which is the longer; *male*, valve short, broad, plates short, scarcely longer than width at base, curving to acute tips, margins sparsely setose.

Whitish, with a large black spot on the center of the vertex, with lines running to the ocelli, a black point at apex; the basal part of pronotum and the elytra, except the blue or green stripes, black; apex of elytra sub-hyaline; beneath whitish. Length: female, 7 mm.; male, 6 mm.

This species is widely distributed throughout the sub-tropical regions. There are specimens in the Carnegie Museum from Pará,

Brazil, Carn. Mus. Acc. No. 2966 (H. H. Smith *coll.*) and four from Guatemala. The author's collection includes specimens from various points in Mexico, Guatemala, Costa Rica, and the West Indies, and it has been recorded from many localities by Signoret, Fowler, and others, in the United States, Central America, and the West Indies.

It varies in the extent of the blue or green stripes of the elytra, and Fowler has indicated as a variety, *T. delineata*, a form which is larger and with the general ground-color darker, the elytra of a rich reddish brown or brown color, with very conspicuous light blue or grayish blue stripes. A specimen from Pará has the elytra entirely greenish, except the apical hyaline portion, but in other respects it appears to belong here.

117. *Cicadella similis* (Walker).

Tettigonia similis WALKER, List Homopt. B. M., III, 1851, p. 769.

Tettigonia herbida SIGNORET, Ann. Soc. Ent. Fr. (3) II, 1854, p. 18, pl. 2, fig. 4.—STÅL, Rio. Jan. Hemipt., II, 1862, p. 42.—UHLER, Proc. Zool. Soc. Lond., 1895, p. 77.

Kolla herbida DISTANT, Ann. Mag. Nat. Hist. (8) I, 1908, p. 529; II, 1908, p. 62.

Helechara communis WALKER, List Homopt. B. M., Suppl., 1858, p. 235.

Tettigonia prolixa FOWLER, Biol. Cent.-Am., Homopt., II, 1900, p. 275, pl. 18, fig. 18.

Genitalia: female, last ventral segment carinate, hind border nearly truncate; *male*, valve minute or covered, plates short, acuminate, borders setose.

Light green; head, anterior border of pronotum, scutellum and underside, light yellowish-green; an apical point and an intricate pattern of narrow lines on the vertex, numerous arcs on the front, inscribed lines on anterior border of pronotum, and usually a dot or series of short lines on the scutellum, black. Length: female, 6.5 mm; male, 6 mm.

This species is extremely abundant, occurring throughout a great range in tropical and sub-tropical America. It has been recorded from Florida, the West Indies, and Mexico.

There are specimens in the Carnegie Museum from Minca, Colombia, and from Bahia, Rio de Janeiro, Santos, San Antonio de Guaporé, Brazil. The last record gives "sweeping on Island in Rio Guaporé" (Haseman). The author's collection includes numerous specimens from the southern United States, West Indies, Mexico, and Central and South America. From the locations and personal collecting I may state that it particularly inhabits grassy lowlands and is certainly a grass-feeding species. From its distribution it may be inferred that

it has spread from a tropical habitat to the southern United States by way of Mexico or the West Indies.

118. **Cicadella aurivagula** (Jacobi).

Tettigoniella aurivagula JACOBI, Sitzb. Gesell. Nat. Fr. Berl., 1905, p. 178.

Genitalia: male, valve wanting; plates small, broadest at base, narrowed rapidly to slender divergent blunt tips, which extend half-way the length of the pygofer.

Deep orange above, with light ivory-yellow markings in the form of a large triangle on the vertex, the edges of which touch the ocelli. On the pronotum the ivory-yellow forms a broad stripe on each side, leaving a central triangular median area; scutellum yellowish; elytra orange, a broad ivory-yellow patch on central part of the clavus, extending on to the corium, a subhyaline yellowish area midway on the costa, bounded in part by ivory-yellow bands; the apex hyaline, preceded on costal portion by a red patch; beneath fulvous; abdomen darker orange. Length: 7 mm.

A specimen from Provincia del Sara, Bolivia, 450 m., Carn. Mus. Acc. No. 6443 (Steinbach *coll.*); specimens in the author's collection from Mapiri, Bolivia, and Marcapata, Peru. This is a striking species and easily recognized by the orange and ivory coloration.

119. **Cicadella prætextatula** (Jacobi). Pl. XIV, figs. 36, 36a.

Tettigoniella prætextatula JACOBI, Sitzb. Gesell. Nat. Fr. Berl., 1905, p. 184.

Head nearly as wide as pronotum, short, broad; vertex scarcely as long at middle as next the eye, polished; front flattened, minutely striate; clypeus swollen at base, narrowed and slightly carinate at tip; pronotum twice as long as vertex, truncate behind. *Genitalia: male*, valve short, transverse, plates narrow, elongate, margins sinuate, contracted at about the middle, and extending as long slender tips three-fourths the length of the pygofer, within which the tips are concealed.

Light yellow, vertex black with two dots at the apex, and four on the hind border, the outer ones including the ocelli, yellow; pronotum olive-green, the anterior border tawny tinged with red; elytra olive with the veins reddish; face yellow with front suffused with brown, and with a white dash at base; legs tinged with fuscous. Length: 9 mm.

Re-described from a long series of specimens from Chulumani and Coroico Yungas, Bolivia, in the author's collection. Specimens have been presented to the Carnegie Museum.

120. **Cicadella inscriptula** sp. nov. Pl. XIV, figs. 34, 34a.

Head wider than pronotum, eyes prominent, vertex rounded, about half as long at middle as between eyes, front somewhat flattened and

striate on the disk; clypeus prominently elevated at base, contracted at tip; pronotum half longer than vertex, faintly emarginate behind. *Genitalia: male*, valve short, plates broad at base, curving to narrow elongate tips, which reach slightly beyond tip of the pygofer.

Varicolored, the disk of pronotum and the elytra a rich purple-red, with more distinct purplish patches in the elytral cells. The vertex, anterior part of pronotum, and the scutellum tawny, with intricate black lineations or inscriptions; hind border of pronotum, and a median patch near the front, blackish; the front yellowish, with arcs and numerous median dots tawny or yellowish; clypeus, loræ, and cheeks, mostly black; pectus and disk of abdomen, mostly black with lateral spots, and base of plates, yellow; legs, testaceous. Length: 9 mm.

Described from specimens in the author's collection, Chulumani, Bolivia, Dec. 9, 1898. This is a very handsome species, the color-pattern so intricate as to make description difficult, but clearly shown in the figure.

121. *Cicadella occipitula* sp. nov. Pl. XIV, figs. 39, 39a.

Head scarcely as wide as pronotum, short, broadly rounded; vertex scarcely more than half as long as width between the eyes; front convex; clypeus enlarged at base, carinate toward tip; cheeks very narrow; pronotum twice as long as vertex, faintly emarginate behind. *Genitalia: male*, valve short, plates elongate triangular, narrowed beyond the middle to slender elongate tips, enclosed between the margins of the pygofer.

Yellow, anterior part of pronotum tinged with green, the basal part and scutellum mostly dark fuscous, elytra suffused with fuscous, brownish toward the base, with narrow greenish yellow lines on the clavus and in cells of corium; vertex black, with a transverse row of yellow spots, the outer ones including the ocelli; a pair of small yellow dots at apex; front fuscous, with faint arcs; tips of tibiæ and tarsi, somewhat infusate. Length: 8 mm.

Specimens from Chulumani, Bolivia, Dec. 9, 1898, in the author's collection.

122. *Cicadella limboclavula* sp. nov. Pl. XIV, figs. 42, 42a.

Head as wide as pronotum, sub-angulate, vertex twice as long at middle as next the eye, with a faint depression on the disk; front convex, slightly flattened on the disk; clypeus inflated at base, narrowed at tip; pronotum widening behind, hind border slightly concave; scutellum acuminate. *Genitalia: male*, valve hidden; plates broad at base, contracted abruptly about one-third their length and extending in long narrow tips to the end of the pygofer.

Black, the pronotum with a transverse band of bluish yellow, sometimes interrupted at the middle, the clavus with a broad inner border of bluish white, an elongate bluish spot near its base, three elongate bluish spots toward the tip, and a whitish line parallelling the costa on the corium; toward the tip the elytra are somewhat translucent; face with numerous black arcs; a black spot at tip of vertex; lower part of front, clypeus, and margins of cheeks, black; propleuræ and disk of abdominal segments, blackish; legs yellow; tips of tibiæ and tarsi, blackish. Length: 7.5 mm.

Described from a series of specimens from Chulumani, Bolivia, November and December, 1898, Coroico Yungas, Bolivia, April 16, 1899, in the author's collection.

123. *Cicadella scutellatula* sp. nov. Pl. XIV, figs. 37, 37a.

Head narrower than pronotum, short, rounded; vertex half as long as width between the eyes; front long, slightly convex; clypeus elevated; pronotum twice as long as vertex, hind border faintly emarginate; scutellum rather small, acuminate at tip. *Genitalia: male*, valve hidden, or barely exposed; plates elongate triangular, narrowed to slender elongate tips, reaching nearly to the tip of the pygofer.

Pronotum and elytra, brown; pronotum with a pair of black spots on the disk, a median line expanded anteriorly, two small spots next the anterior border, black; vertex black, with yellow spots including the ocelli, yellow hind border, inner margin of eye, and an intricate picture of yellow arcs and a central yellow stripe on the front; outer part of clypeus yellow, beneath black, tip of pygofer whitish; legs black, except anterior tibia, an apical band on hind tibia and most of the first tarsal joint, which are dull whitish. Length: 7 mm.

Described from a series of specimens from Chulumani, Bolivia, November and December, 1898, and Coroico Yungas, Bolivia, April 16, 1899, in the author's collection.

124. *Cicadella semicinctula* sp. nov. Pl. XV, figs. 49, 49a.

Head scarcely as wide as pronotum, short, rounded; vertex about half as long as width between the eyes; front slightly convex, somewhat flattened on the disk; clypeus with an elevated central ridge; pronotum widening behind, posterior border truncate; scutellum acuminate. *Genitalia: male*, valve hidden; plates long, narrow, extending into slender tips as long as the pygofer.

Light brown, with bright yellow spots on the elytra, forming half bands; vertex black, ocelli and space behind them, occiput and inner border of eye, yellowish; anterior border of pronotum, and the hinder margin faintly yellowish; elytra dark brown, slightly purplish; scutellum brown; pectus black; meso- and meta-sternum whitish; abdominal segments black, margined with whitish; plates light

brown, tips blackish; face black; antennæ whitish; legs pale yellowish or whitish. Length: 6 mm.

Described from three specimens, two from Chulumani, Nov. 30, 1898, and one from Coroico Yungas, Bolivia, April 16, 1899, in author's collection.

125. *Cicadella nigricula* sp. nov. Pl. XIV, figs. 38, 38a.

Head broad, short; vertex half as long as width between the eyes; ocelli near the hind border; front somewhat flattened, full; the clypeus somewhat inflated at base, faintly carinate toward tip; pronotum twice as long as vertex, lateral margins short, postero-lateral angles rounded; scutellum large, acuminate; elytral veins obscure. *Genitalia: male*, valve hidden; plates short with a peculiar reduplication giving appearance of two pairs of plates, about half the length of the pygofer.

Dark fuscous or blackish, rather densely dotted with whitish or yellow, the dots on forepart of pronotum and central part of scutellum fewer, larger, and brighter yellow; front dotted with pale yellow, except toward tip; the clypeus, loræ and cheeks, black; beneath black, margins of the segments, especially the last ventral, and line on pygofer, brown. Legs pale brownish. Length: 8 mm.

Described from one male (type) in the author's collection, from Chulumani, Bolivia, Dec. 9, 1898. This species seems to be related to *C. contaminata*, but is much darker, and the genital segment is quite different.

126. *Cicadella ornatula* sp. nov. Pl. XIV, figs. 41, 41a.

Head slightly wider than pronotum, short; vertex scarcely longer at middle than next the eye; front slightly flattened on the disk; clypeus slightly swollen at base and carinate toward the tip; pronotum twice as long as vertex, faintly marginate behind. *Genitalia: male*, valve short, transverse, plates very long, narrowly triangular, tapering to acute tips and extending three-fourths the length of the slender pygofer.

Varied with tawny, blue and red; vertex tawny orange, with three conspicuous black spots, one at apex, and one on each side between eye and ocelli, connected by slender line; anterior border of pronotum tawny; transverse curved band and hind border bluish, hinder part of disk brown, scutellum orange-red, elytra with stripes of blue and red, resembling those of *Graphocephala coccinea*; face tawny, sides of front with dusky arcs; abdomen tinged with reddish, legs pale yellowish. Length: 7 mm.

Described from a series of five specimens from Coroico Yungas, Bolivia, April 16, 1899, in the author's collection. This is a very

handsome species, quite close to *T. facetula* Jacobi, but with a different color-pattern, and quite distinct genitalia.

127. *Cicadella facetula* (Jacobi). Pl. XIV, figs. 35, 35a.

Tettigoniella facetula JACOBI, Sitzb. Gesell. Nat. Fr. Berl., 1905, p. 184.

Head nearly as wide as pronotum, short, distinctly curved, vertex slightly longer at middle than next the eye; front slightly flattened; pronotum nearly three times as long as vertex, scarcely emarginate behind. *Genitalia: male*, with a small obtusely angular valve, and short plates, contracted toward the tip, and about half as long as pygofer.

Greenish yellow, vertex with a black point at apex, black ocelli, and faint brown lines; pronotum tawny anteriorly, the disk and the elytra, olive-green; scutellum and sutural border of elytra, tawny; costa tawny, tinged with yellow; beneath light yellow, the front with faint lateral arcs. Length: 7 mm.

Jacobi described this species from the Andean region and specimens are in my collection from Chulumani, Bolivia, Dec. 9, 1898, and Rioja, Peru, from the Jacobi collection.

128. *Cicadella tigrinula* sp. nov. Pl. XIV, figs. 40, 40a.

Head as wide as pronotum, vertex somewhat produced, faintly angular, about half longer at middle than next the eye; front flattened on the disk, clypeus slightly swollen at base, carinate toward the tip; pronotum half longer than vertex, slightly concave behind. *Genitalia: male*, valve hidden; plates narrow, contracted to near the middle and extending in long slender tips to end of pygofer.

Coppery brown, with distinct black bands, a transverse one on the vertex, expanded at middle, a narrow border at occiput, and on front of pronotum, a slightly curved transverse band on the disk, and a broad margin on the hind part of pronotum, a curved transverse band on scutellum, black; elytra suffused with olive, and with a whitish yellow line, margined with black, parallelling the costa; face tawny; arcs, sides of clypeus, margin of cheek, and outer part of loræ, black; prosternum and abdominal segments, black, bordered with tawny; plates tawny. Length: 7 mm.

Described from a series of specimens (type and paratypes) from Chulumani, Bolivia, Dec. 9, 1898, and Coroico Yungas, Bolivia, April 16, 1899, in collection of the author. A paratype has been presented to the Carnegie Museum.

129. *Cicadella cyclopula* (Jacobi). Pl. XIV, figs. 44, 44a.

Tettigoniella cyclopula JACOBI, Sitzb. Gesell. Nat. Fr. Berl., 1905, p. 183.

Head as wide as pronotum, short, bluntly rounded; pronotum twice

as long as vertex, nearly truncate behind. *Genitalia: male*, valve short, nearly concealed, plates elongate, triangular, tapering to delicate tips, reaching three-fifths the length of the pygofer.

Light yellow, tinged with orange on the face, and red on the vertex; anterior border of pronotum, the scutellum, the longitudinal stripes on elytra, blood-red; a transverse band before the middle, light blue; hind border, dark blue; elytral stripes dull bluish. Length: 7 mm.

Jacobi's specimens were from the Andean region, and I have one labeled Rioja, Peru, probably from his type material, also a series from Coroico Yungas, Bolivia, which agree perfectly with the Rioja specimen.

130. *Cicadella transversula* sp. nov. Pl. XIV, figs. 43, 43a.

Head as wide as pronotum; vertex half longer at middle than next the eye; front flattened on the disk; clypeus swollen at base, carinate at tip; pronotum half longer than vertex, concave behind. *Genitalia: male*, plates broad at base, narrowing sharply to beyond the basal third, and extended in slender tips to beyond the end of the pygofer.

Black, vertex with anterior border, a transverse occipital line and ocellar spot, four spots in transverse row on anterior margin, and a broken transverse band on the disk of pronotum, orange-yellow; scutellum entirely black; elytra black; basal part of the clavus, orange-yellow, the margin of claval suture and three elongate spots on the corium, greenish; sub-margin of costa, golden-orange; beneath black, face with black arcs on a yellowish ground; legs whitish, tips of tibiae and tarsi, blackish. Length: 8 mm.

Specimens from Chulumani, Bolivia, Dec. 9, 1898, in the author's collection.

Genus *DIEDROCEPHALA* Spinola.

Diedrocephala SPINOLA, Tavola Sinottica dei generi spettanti alla classe degli Insetti Arthroidignati, Hemiptera, L. Latr.-Rhyngota, F. (in *Mem. di Matem. e. di Fis. Soc. Ital.*, Modena, Tom. 25, pt. 1, 1852, pp. 43-100; also as a separate, Modena, (4to.) 1850, pp. 1-57. (Genotype *Cicada variegata* Fabricius, Syst. Rhyng., 1803, p. 67.)

131. *Diedrocephala sanguinolenta* (Coquebert).

Cicada sanguinolenta COQUEBERT, Ill. Icon. Ins., Decas II, 1801, p. 79, pl. 18, fig. 12.—FABRICIUS, Syst. Rhyng., 1803, p. 67.

Tettigonia sanguinolenta BLANCHARD, Hist. Nat. des Ins., pt. III, 1840-1841, p. 191.—SIGNORET, Ann. Soc. Ent. Fr. (3) III, 1855, p. 50, pl. 6, fig. 3.—FOWLER, Biol. Cent.-Am., Homopt. II, 1900, p. 262, pl. XVII, fig. 17.

Tettigonia rubriguttata WALKER, List Homopt. B. M., pt. III, 1851, p. 63.

Head orange-yellow, suffused with brown on the vertex; pronotum brown, with a more or less extensive area of red; elytra black, with

extensive red markings in the form of broken bands behind scutellum, across tip of clavus, and near the tip, and with white hyaline on apex and two triangular white spots on costa near the tip; beneath, face, thorax, and legs, bright orange-yellow; abdomen bright red above, blackish on the disk. *Genitalia: female*, last ventral segment produced into a broad tooth at the middle; convex and sub-carinate; *male*, valve hidden or wanting, plates small, narrowed abruptly near the base, extended as slender, short, acuminate processes, margins bordered with delicate setæ, pygofer contracted at base, strongly setose, and with the plates white. Length: female, 6 mm.; male, 5.5 mm.

This is a widely distributed and variable species. Specimens are in the Carnegie Museum from Rio de Janeiro and Santarem, Brazil, Carn. Mus. Acc. No. 2966, and Cacagualito and Minca, Colombia, Carn. Mus. Acc. No. 1999, both lots collected by H. H. Smith.

Earlier records cover Mexico, Central America, Panama, South America to Brazil.

132. *Diedrocephala variegata* (Fabricius).

Cicada variegata FABRICIUS, Syst. Ent., 1775, p. 684.

Cicada virginea FABRICIUS, Syst. Rhyng., 1803, p. 66.

Tettigonia pulcherrima BLANCHARD, Hist. Nat. des. Ins. III, 1840, p. 192.

Tettigonia variegata SIGNORET, Ann. Soc. Ent. Fr. (3) II, 1854, p. 723, pl. 21, fig. 9.

Tettigonia virginea SIGNORET, Ann. Soc. Ent. Fr. (3) II, 1854, p. 353.

Diedrocephala variegata WALKER, List Homopt. B. M., Suppl., 1858, p. 234.

Head about twice as wide as pronotum, produced, obtusely angulate; vertex with a narrow sulcus; margin acute; front slightly tumid; clypeus a little tumid at base, narrowed to tip; pronotum broadly concave behind; scutellum rather large. *Genitalia: female*, last ventral segment one-half longer than preceding; hind margin with shallow re-entrant angle.

White; the upper side dark fuscous or black; the margin of vertex with a series of curved arcs. Pronotum, scutellum, and base of clavus with a common ivory-white spot widening from the anterior border of pronotum and terminating in sharp angles about the middle of the clavus; a large yellow spot near tip of clavus; the costa white, with oblique fuscous lines toward the tip; a short red line before a hyaline triangle and some red patches on corium, membrane smoky, tipped with black; tips of tarsal joints and claws dark. Length: 8 mm.

This is a common species in tropical America, being one of the earliest described from that region, and numerous records are to be found in the literature.

The specimens in the Carnegie Museum are from Provincia del Sara, Bolivia, 450 m. (Steinbach *coll.*) and from Chapada, Brazil,

November, and Asunción, Paraguay, Carn. Mus. Acc. No. 2966 (H. H. Smith *coll.*).

I have specimens from Costa Rica and Guatemala.

133. **Diedrocephala albula** sp. nov. Pl. XVI, figs. 65, 65a, 65b.

Head narrower than pronotum, distinctly produced; vertex twice as long at middle as next the eye; ocelli as near the hind border as to the eye; front flattened on disk; clypeus contracted apically, slightly angulate in profile; pronotum widening posteriorly, hind border slightly concave; scutellum with spine-like acuminate tip. *Genitalia: female*, last ventral segment nearly twice as long as preceding; hind border nearly truncate; *male*, valve wanting; plates short, triangular, acute at tip, three-fourths as long as pygofer.

Bluish black above, white below; vertex with basal and apical elongate spot, a dot next the eye, pronotum, a median and two discal spots, and a submarginal row of minute dots, scutellum with a basal, two discal, two subapical and a terminal spot, and elytra with four irregular costal, central, claval and some minute discal dots, white or bluish white; abdomen above blackish with whitish borders; genitalia, female segment blackish on the disk and hind border, and pygofer and ovipositor blue-black; tips of tarsi fuscous. Length: 8 mm.

Described from one female (type), Mana River, French Guiana, June, 1917, Carn. Mus. Acc. No. 6008 (S. M. Klages *coll.*); and one male (allotype), Villa Bella, Oct. 7, 1909, Carn. Mus. Acc. No. 4043 (Haseman *coll.*).

Genus GRAPHOCEPHALA Van Duzee.

Graphocephala VAN DUZEE, Check-list of Hemiptera, 1916, p. 66. (Orthotype *Cicada coccinea* Forster, Nov. Spec. Ins., 1771, p. 69.)

134. **Graphocephala coccinea** (Forster).

Cicada coccinea FORSTER, Nov. Spec. Ins., 1771, p. 69.

Tettigonia quadrivittata SAY, Journ. Acad. Nat. Sc. Phila., VI, 1831, p. 312.

Tettigonia coccinea HARRIS, in Hitchcock, Geol. Mass., Ed. 1, 1833, p. 584.—

RATHVON, in Mombert's Hist. Lancaster Co., Pa., 1869, p. 551.

Tettigonia picta WALKER, List Homopt. B. M., pt. III, 1851, p. 758.

Tettigonia teliformis WALKER, *l. c.*, p. 764.

Diedrocephala coccinea UHLER, Bull. U. S. Geol. Geogr. Surv., I, 1876, p. 357.

?*Tettigonia idonea* FOWLER, Biol. Cent.-Am., Homopt., II, 1900, p. 276, pl. XVIII, fig. 22.

Head wider than pronotum, subangular in front, margin with a sharp edge; vertex about three times as long at middle as next the eye; front tumid, somewhat flattened on the disk, striate at the

sides; clypeus tumid, carinate toward the tip; pronotum one-fourth longer than vertex; lateral margins long; hind border sinuate. *Genitalia: female*, last ventral segment long, nearly four times as long as preceding; hind border produced, rounded; *male*, last ventral segment slightly longer than preceding; valve concealed; plates broad at base, narrowing before the middle and extended as narrow, conical acutely pointed tips, reaching two-thirds the way to end of pygofer.

Light yellow; vertex with a black border before, extending on to base of front. Pronotum green or blue-green with an orange flask-shaped spot on either side; anterior border yellowish; elytra green, or blue, with conspicuous red stripes, one on the clavus, the second just below claval suture, the third paralleling the costa and extending from near the base to apex, sometimes interrupted and in some cases merged at base and tip with the sub-claval stripe. Length: female, 8 mm.; male, 7 mm.

One specimen, Minca, Colombia, June, Carn. Mus. Acc. No. 1999 (H. H. Smith *coll.*).

This is a very common species represented by numerous variations and ranging from Canada to the tropics. The single specimen which is referred to this species has been mutilated and lacks the head and abdomen, but the pattern of pronotum and elytra are unmistakable and it corresponds with forms which have the blue and red coloration quite intense.

135. *Graphocephala tractatula* (Jacobi).

Tettigoniella tractatula JACOBI, Sitzb. Gesell. Nat. Fr. Berl., 1905, p. 182.

Slender; head scarcely as wide as pronotum, distinctly angular; vertex about twice as long at middle as next the eye, margin sharply angled to front; front broad, tumid, somewhat flattened on the disk; clypeus elevated at base, somewhat contracted toward the tip; cheeks narrow; pronotum strongly arched in front, scarcely concave behind. *Genitalia: male*, last ventral segment concave; valve hidden; plates short; outer margin convex; tips rounded, about one-half as long as the compressed, narrow pygofer.

Vertex yellow with a broad ocher-orange band, tinged with reddish; pronotum with two transverse broken bands and the hind border yellow; scutellum orange with three narrow yellow lines; elytra red-brown, with a number of short, narrow, yellowish lines on the clavus and on the discal nervures, and three yellowish spots near the apex, beyond which is a smoky hyaline area margined with fuscous; beneath, face mostly black, front with brownish sides and light arcs; prothorax yellow; mesothorax black, abdomen beneath black; legs light yellowish; genital plates yellow; pygofers margined with orange. Length: 7 mm.

This species was described from Rioja, Peru, and the author's

collection includes a specimen from the same locality and also a number from Coroica Yungas, Bolivia, collected April 16, 1899.

136. **Graphocephala attenuata** sp. nov. Pl. XV, figs. 51, 51a.

A large species, mostly black, with a broad white band across base of elytra; head scarcely wider than pronotum; vertex moderately produced, bluntly angular, margin reflected; pronotum slightly widening behind, twice as long as vertex, hind border concave; elytra long, tips compressed. *Genitalia: male*, valve hidden; plates broad at base, attenuate toward tip, about three-fourths as long as pygofer.

Black, vertex with pale yellow spot including ocellus; the anterior border of pronotum and most of the scutellum tawny; base of elytra milky white, tips smoky hyaline; tip of clypeus, tips of femora, and discal half of tibiæ, and the tarsi, whitish. Length: 9 mm.

Described from a series of ten specimens (type and paratypes) from Coroico Yungas, Bolivia, April 16, 1899, in the author's collection. A paratype has been presented to the Carnegie Museum.

137. **Graphocephala simillima** sp. nov. Pl. XV, figs. 55, 55a.

Vertex produced, distinctly angular, margin reflexed; pronotum with sides nearly parallel; elytra elongate, compressed at tip. *Genitalia: male*, valve hidden; plates broad at base, narrowing to acuminate tip, strongly upcurved, reaching nearly to the tip of pygofer; plates and pygofer shorter than in *G. attenuata*.

Vertex whitish, tinged with yellow, margined with black; anterior part of pronotum and the scutellum tawny; disk of pronotum blackish; elytra black, with a transparent whitish patch at base, extending in smoky sub-hyaline area on clavus, and the tip smoky hyaline; beneath black, the margins of the segments, tips of femora, fore and middle legs whitish. Length: 8.5 mm.

Described from a series of ten specimens (type and paratypes) from Coroico Yungas, Bolivia, November, 1898, and April, 1899, in the author's collection. A paratype has been deposited in the Carnegie Museum.

138. **Graphocephala atramentatula** (Breddin). Pl. XVI, figs. 61, 61a.

Tettigonia atramentatula BREDDIN, Soc. Ent., Vol. XVI, 1901, p. 107.

Head broad, wider than pronotum; vertex angular, margin slightly elevated; pronotum half longer than vertex, slightly concave behind; male valve hidden; plates large, broad at base, contracted toward the tip, and extended as distinctly upcurved ends to near tip of pygofer.

Vertex, most of pronotum, and base of elytra, dull white; scutellum tawny; elytra black, apex smoky; beneath mostly black, outer part

of legs, margins of abdominal segments, dull whitish or yellow. Length: 8 mm.

Specimens in the author's collection from Archidona, Ecuador, which probably represent the type material.

139. **Graphocephala brevisula** sp. nov. Pl. XVI, figs. 62, 62a.

Small, head as wide as pronotum; vertex twice as long at middle as next the eye, flat, fore margin angular; disk of front distinctly flattened; clypeus swollen at base and contracted toward the tip; pronotum half longer than vertex, hind border faintly concave. *Genitalia: male*, valve hidden or wanting; plates very short abruptly contracted near the base and with short slender inner part extending to half the length of the pygofer and with the tips involute or partly concealed within the ventral margins of the pygofer.

Disk of pronotum and the elytra dark olive; vertex, anterior border of pronotum, scutellum, and costal and anal margins of elytra orange-yellow; face suffused with blackish; abdomen above and the wings fuscous; pectus and venter and the legs yellow. Length: 5.5 mm.

Described from two males (type and paratype) in the author's collection from Archidona, Ecuador. These specimens were received unnamed in a lot of homoptera secured from a German dealer along with a number of Breddin's species, and I have been unable to find any description of it. While nearly related to *olivatula* and *atramentatula* it is smaller and the male plates so distinct that it seems proper to describe it.

140. **Graphocephala involuta** sp. nov. Pl. XV, figs. 56, 56a.

Head scarcely as broad as pronotum; vertex bluntly angular, broadly depressed anteriorly; pronotum scarcely twice as long as vertex, concave behind. *Genitalia: male*, valve hidden; plates narrow, tips strongly upcurved and folded within the pygofer.

Blackish, vertex with yellow spots behind ocelli, and yellow border; pronotum blackish tinged with olive, bordered anteriorly with orange-yellow, dotted with black; scutellum black with yellow disk and lateral stripes; elytra blackish tinged with greenish, a paler patch on the border of clavus, the disc of corium, and a yellowish line bordering costa; front black, sides pale with black arcs; clypeus black, polished; pectus and venter, blackish, with segments narrowly margined with whitish; legs dull whitish. Length: 6.5 mm.

Described from a large series of specimens (type and paratypes) from Coroico Yungas, Bolivia, April 16, 1899, in the author's collection. Paratypes have been presented to the Carnegie Museum.

141. *Graphocephala contractula* sp. nov. Pl. XV, figs. 47, 47a.

Head as wide as pronotum; vertex bluntly angular, margin slightly elevated; pronotum half longer than vertex, sides nearly parallel, hind border concave at middle. *Genitalia: male*, valve hidden; plates broad at base, convex at sides, narrowing to short slender upturned tips, three-fourths as long as pygofer.

Vertex pale orange, margined with black and with a central black line; pronotum, tawny, somewhat infuscated behind; scutellum tawny, with basal and marginal dots, blackish; elytra smoky with whitish hyaline base and apex; beneath black, venter and legs more or less whitish. Length: 6.5 mm.

Described from a long series of specimens (type and paratypes) in the author's collection, from Coroico Yungas, Bolivia, April 16, 1899. Paratypes have been communicated to the Carnegie Museum.

142. *Graphocephala curvatula* sp. nov. Pl. XV, figs. 53, 53a.

Head scarcely as wide as pronotum; vertex short, depressed anteriorly, half as long as pronotum; pronotum widening behind, hind border slightly concave; elytra long. *Genitalia: male*, valve hidden; plates elongate, narrowing on outer third and extending into slender strongly curved tips, reaching nearly tip of pygofer, which has a pair of strongly curved appendages at tip.

Golden brown, vertex black, with a spot on each side behind ocelli, and inner margin of eye brown; pronotum blackish on the disk, and brown on the anterior border; scutellum brown with black spots in the angles and at the sides; elytra rich golden-brown, pellucid; beneath black; rostrum, fore and middle tibiæ pale brown. Length: 9 mm.

This large handsome species is described from five male specimens (type and paratypes) in the author's collection, from Chulumani, Bolivia, Dec. 9, 1898.

143. *Graphocephala personatula* (Jacobi). Pl. XV, figs. 54, 54a.

Tettigoniella personatula JACOBI, Sitzb. Ges. Nat. Fr. Berl., 1905, p. 181.

Head as wide as pronotum, rather short, subangulate; vertex one-fourth longer at middle than next the eye, with a depression outside the ocelli and behind the apex; margin sharp; front in profile nearly straight; clypeus swollen at base, narrowed at tip; pronotum twice as long as vertex, subangulate, emarginate behind. *Genitalia: male*, valve very short; plates narrow; sides nearly parallel; tips rounded and blunt, one-half as long as pygofer.

Above reddish brown or dark testaceous; the vertex with a central black area and black spots in the lateral depressions; pronotum with a median line, a patch on each side on the disk and hind border,

fuscous; scutellum with a fuscous patch, and a smaller patch on each side one-half way to the angle; elytral veins broadly fuscous; apex smoky-hyaline; beneath, front dark brown, with a somewhat obscure blackish central stripe; rest of face black; pectus black; legs and abdomen testaceous. Length: 7 mm.

Numerous specimens in the author's collection from Coroico Yungas, Bolivia, April 16, 1899, and one specimen from Vilcanota, Peru, one of the type-localities cited by Jacobi. Specimens have been presented to the Carnegie Museum.

144. *Graphocephala affinula* sp. nov. Pl. XV, figs. 48, 48a.

Head scarcely as wide as pronotum, angular; margin fairly acute; vertex nearly twice as long at middle as next the eye, depressed anteriorly, and outside of ocelli; the front broad, slightly convex; clypeus long, sub-carinate; loræ slightly elevated; pronotum nearly twice as long as vertex, slightly emarginate behind; elytral veins conspicuous. *Genitalia: male*, valve hidden, plates long, with elongate triangular impression at base, and the tips curved in and partly concealed within the pygofer.

Coppery yellow, the vertex with a black spot in the anterior depression, with a black line running to the occiput, black spots in the depressions outside ocelli, a broad black stripe on the front, and sides of the clypeus, a black spot on each side of pectus; the abdominal segments black, margined with whitish; plates dull whitish; the veins of elytra brown, the costa tinged with reddish. Length: 7 mm.

Described from two specimens (type and paratype), Coroico Yungas, Bolivia, April 16, 1899, in the author's collection. This species is close to *G. personatula*, and would be considered a variation from that species, were it not for the quite distinct genitalia.

145. *Graphocephala longula* sp. nov. Pl. XV, figs. 57, 57a.

Similar to *personatula*, but with distinct genitalia. Vertex distinctly angular, depressed anteriorly; pronotum widening behind, half longer than vertex. *Genitalia: male*, valve large, obtusely angular; plates narrow, elongate, outer margin slightly sinuate, tips divergent, sub-acute, reaching tip of pygofer.

Vertex yellow with black central and lateral areas, red ocelli; pronotum olive-brown, anterior part yellow, inscribed with black; scutellum brown, with two discal stripes, lateral angles and tip yellow; elytra pellucid, tinged with yellow, veins brown, costa margined with yellow; face and underside black; apex of femora, the tibiæ and tarsi pale brown. Length: 7 mm.

Described from two specimens (type and paratype), Coroico Yungas,

Bolivia, Aug. 16, 1899. This and the following species closely resemble *G. personatula*, but have very different genital plates.

146. ***Graphocephala separata*** sp. nov. Pl. XV, figs. 46, 46a.

Vertex bluntly angular, depressed anteriorly and on median line; pronotum widening behind with an angular emargination posteriorly. *Genitalia: male*, plates separated at base, carinate on disc, converging and slightly infolded at tip, but not reaching tip of pygofer.

Tawny brown, vertex with a black median line expanded into a broad triangle anteriorly, and two black spots behind ocelli; pronotum brown, tawny, faintly marked with fuscous on the disk; elytra pale brown, veins infuscate; beneath, face yellow with a broad median stripe and lateral margins on front; clypeus mostly black; venter black, segments narrowly margined with whitish, plates pale brown, legs pale yellowish. Length: 6.5 mm.

Described from ten specimens, males (type and paratypes) from Coroico Yungas, Bolivia, April 16, 1899. Differs from *G. longula* in genitalia and also in color. A paratype has been deposited in the Carnegie Museum.

147. ***Graphocephala cardinula*** sp. nov. Pl. XV, figs. 52, 52a.

Similar to preceding species in general pattern, but bright red above, and yellow below. Vertex angular, depressed anteriorly; pronotum with sides nearly parallel. *Genitalia: male*, valve hidden or wanting; plates narrowing to a little beyond the middle, and extended in slender tips to near the end of the pygofer.

Vertex, pronotum, and scutellum red, with a black median line, expanded at apex of vertex on disk of pronotum, and forked on scutellum; also lateral areas on vertex, part of anterior margin of pronotum, hind border, and spot in angles of scutellum, black; beneath yellow, front tinged with orange. Length: 7 mm.

This is a handsome little species, represented by a long series of specimens (type and paratypes) from Coroico Yungas, Bolivia, April 16, 1899, in the author's collection. Paratypes have been presented to the Carnegie Museum.

148. ***Graphocephala ludicula*** Breddin (?).* Pl. XVI, figs. 58, 58a.

Small, head scarcely as wide as pronotum, vertex angulate, margin acute, pronotum half longer than vertex; male valve short, rounded behind; plates contracted toward tip, and extending to tip of pygofer. Length: 6 mm.

Four specimens in the author's collection from Archidona, Ecuador.

*See footnotes on next page.

149. *Graphocephala plebejula* Breddin (?).* Pl. XVI, figs, 69, 69a.

Similar to *G. ludicula*, narrow, head as wide as pronotum; vertex obtusely angular; pronotum half longer than vertex; male valve hidden, plates very short, abruptly contracted close to base, slender tips extending two-thirds the length of the pygofer.

Greenish, vertex yellowish, bordered with black, and a median black spot, anterior part of pronotum yellowish, costa brown, with a narrow yellow margin, tip of elytra smoky, beneath black, margins of abdominal segments yellow, legs infusate. Length: 6 mm.

Two specimens in the author's collection, from Archidona, Ecuador.

150. *Graphocephala pruriginosula* (Jacobi). Pl. XV, figs. 50, 50a.

Tettigoniella pruriginosula JACOBI, Sitzb. Ges. Nat. Fr. Berl., 1905, p. 181.

Head nearly as wide as pronotum; vertex one-half longer at middle than next the eye, depressed on the disk; anterior margin elevated, sharp; front tumid with disk somewhat flattened; clypeus tumid at base, contracted toward tip; pronotum one-half longer than vertex with two punctures near the anterior border; hind border slightly concave. *Genitalia: male*, last ventral segment slightly concave; valve hidden; plates narrowed to middle, then extending as narrow, strap-like tips, ending bluntly, one-fourth distance from tip of pygofer; the hinder part of pygofer is separated and the narrowed part of plates lie in the groove thus formed.

Black; vertex with two large spots including ocelli; lateral portion of hind border, two anterior stripes, and a diffused transverse band on pronotum, two divergent discal stripes, the basal angles and apex, and the costa, ocher-red; the legs and hind margins of abdominal segments dull yellowish. Length: 7 mm.

Numerous specimens in the author's collection from Coroico Yungas, Bolivia, April 16, 1899, and one specimen from Vilcanota, Peru, one of the type localities, and possibly from type material, with determination by Jacobi. Specimens have been communicated to the Carnegie Museum.

* My collection includes two species, secured from a German dealer, labelled *Tettigonia ludicula* and *T. plebejula* Breddin. As I cannot find these names in any published reference at hand, it seems probable that they are manuscript-names. However, if published, the use of Breddin's names will avoid confusion.

[NOTE. The Editor of these Annals, assisted by Mr. Hugo Kahl, has independently searched the literature with all available indices at hand, and is satisfied that the names, here credited to Breddin with a question, are unpublished, and that species nos. 148 and 149, as well as no. 111, should be credited to Osborn as *spp. nov.* W. J. Holland.]

151. *Graphocephala braccatula* (Jacobi).

Tettigoniella braccatula JACOBI, Sitzb. Ges. Nat. Fr. Berl., 1905, p. 181.

Head wider than pronotum; vertex about one-fourth longer at middle than next the eye; apical margin elevated, sharp; front flattened on the disk; clypeus elevated on the middle; pronotum twice as long as vertex, truncate behind. *Genitalia: male*, last ventral segment concave; valve hidden; plates short; outer margin rounded, half as long as pygofer, similar to *G. tractatula*.

Vertex light yellow with a broad median stripe, expanded before; face black; pronotum with a black patch just within the eye and a fuscous border posteriorly; scutellum and base of elytra yellowish or whitish, suffused with rose-color; costa orange-ocherous; legs pale yellowish; abdomen black, segments with narrow pale margins. Length: 6 mm.

Numerous specimens in the author's collection from Coroico Yungas, Bolivia, April 16, 1899, and also two specimens determined by Jacobi, one from Callanga, Peru, and one from Mapiri, Bolivia. Jacobi gave "Marcapata, Peru," and "Curoico, Bolivia" in his description. Specimens have been presented to the Carnegie Museum.

152. *Graphocephala marginella* (Fabricius).

Cicada marginella FABRICIUS, Mant. Ins., 1787, p. 27.

Tettigonia ruficaput WALKER, List Homopt. B. M., pt. III, 1851, p. 766.

Tettigonia marginella SIGNORET, Ann. Soc. Ent. Fr. (3) II, 1854, p. 346, pl. 11, fig. 8.

Genitalia: male, valve wanting; plates elongate, narrowing to apical fourths and extended into slender upturned acute tips; *female*, last ventral segment elongate, convex; hind border slightly produced; pygofer and ovipositor short, compressed.

Yellowish or luteous; a black point at the tip of head; vertex with disk marked with slender black and grey lines and a wide border of orange-red margined with black; pronotum dark green, the anterior lighter with some black dots on fine lines, lateral border rufous; scutellum yellowish with fine black lines and dots; elytra dark green, costal margin orange-red; abdomen above black, yellow beneath; legs fulvous. Length 5 mm.

Six specimens from Chapada, Brazil, November, Carn. Mus. Acc. No. 2966 (H. H. Smith *coll.*).

Our specimens agree better with the description of Walker than with the figure and description of Signoret, but it is probable that his specimens were faded or decolorized, although the markings of the scutellum could not easily be overlooked.

153. *Graphocephala limbaticollis* (Stål).

Tettigonia limbaticollis STÅL, Stett. Ent. Zeit., XXV, 1864, p. 75.—FOWLER, Biol. Cent.-Am., Homopt. II, 1900, p. 279, pl. XVIII, fig. 27.

Diedrocephala limbaticollis OSBORN, Ohio Nat., IX, 1908, p. 463.

Head produced; vertex acutely angular, rounded at tip. *Genitalia: female*, last ventral segment nearly truncate.

Light yellowish or whitish; vertex with fuscous lines converging towards the tip; a median black line on vertex and a marginal black line just below the border of the vertex on the front; pronotum olive-green, anterior border yellowish; scutellum yellowish; elytra bronzy green; the costa at base narrowly yellowish; abdomen above orange-brown, beneath whitish; tips of tarsi fuscous. Length: 6 mm.

One specimen, a female, from Minca, Colombia, May, 1898, Carn. Mus. Acc. No. 1999 (H. H. Smith *coll.*). The species was originally described from Mexico by Stål, and recorded by Fowler from Tobasco. It has also been recorded by the author from Los Amates and Puerto Barrios, Guatemala, but the present record is the first from South America.

154. *Graphocephala submarginalis* sp. nov. Pl. XVI, figs. 72, 72a, 72b.

Similar to *G. coccinea*; the head scarcely as wide as pronotum; vertex a little more than twice as long at middle as next the eye; margin obtusely angular; front tumid, flattened on the disk; clypeus slightly tumid at base, narrowed, but not distinctly carinate at tip; pronotum nearly twice as long as vertex, broadly rounded in front, nearly truncate behind; elytral veins indistinct. *Genitalia: female*, last ventral segment elongate, about twice as long as preceding segment, narrowed and roundly produced at apex; *male*, valve hidden; plates narrowed, compressed, acutely pointed, about two-thirds length of pygofer.

Light yellow; vertex yellow-fulvous with anterior submargin black-lined; the margin orange, lined below with black. Pronotum green or bluish green, the anterior border orange-red, and a quadrate dull orange-red spot on either side of the disk; scutellum yellowish, tinged at apex with fulvous; elytra blue-green with three conspicuous orange-red stripes, one from base to beyond middle of clavus, the second just below the claval suture, and the third more or less broken, nearly paralleling the costa; costal margin narrowly yellow; wings smoky; veins fuscous; anterior tibiae orange-red; abdomen above orange; pygofer tinged with fulvous. Length: female, 7 mm.; male, 6.5 mm.

Three specimens, two females, type and paratype; one male, allotype, Provincia del Sara, Bolivia, April, 1913 (J. Steinbach *coll.*).

This species is strikingly like *G. coccinea*, but aside from the very

distinctly shorter vertex, with its black submargin, the pattern on the pronotum is distinctly different, the outer stripe of the elytra has a marked break on the cross-nervures and the female genital segment is different.

155. *Graphocephala rufimargo* (Walker).

Tettigonia rufimargo WALKER, List Homopt. B. M., Suppl., 1858, p. 197.—FOWLER, Biol. Cent.-Am., Homopt., II, 1900, p. 284, pl. XIX, fig. 11.

Head wider than pronotum; vertex as long at middle as between the eyes; ocelli near the base; margin obtusely angulate; front tumid; clypeus narrow, elevated; pronotum as long as vertex; scutellum small, triangular. *Genitalia: female*, last ventral segment long, produced, bluntly angulate behind; *male*, last ventral segment long, truncate; plates broad at base, triangular, somewhat acuminate and divergent at tips, less than half as long as pygofer.

Pale yellow; vertex with black lines converging toward the center, usually with a distinct line anteriorly meeting a black spot, or, in some cases, a triangular area margined with black, the anterior border black-lined; pronotum olive-brown, anterior border yellowish; scutellum yellow; elytra reddish-brown suffused with olive; costal margin yellowish; abdomen margined with red. Length: 5 mm.

Specimens from Bonda and Cacagualito, Colombia, May, June and July, Carn. Mus. Acc. No. 1999 (H. H. Smith *coll.*).

These specimens differ from the typical form in the darker reddish brown elytra and in some individuals seem to have a different picture of lines on the vertex, but I believe they must at best be considered only as a variety.

156. *Graphocephala rufimargo* (Walker) var. *proprior* Fowler.

Tettigonia rufimargo WALKER, List Homopt. B. M., Suppl., 1858, p. 197.—FOWLER, Biol. Cent.-Am., Homopt., II, 1900, p. 284, pl. XIX, fig. 12.

Head as wide as pronotum, produced at front, as long at middle as between eyes; front somewhat flattened. *Genitalia: female*, last ventral segment elongate, more than twice as long as preceding segment, produced and bluntly angulate at middle of hind border; *male*, plates narrow, contracted and compressed, with acute tips.

Dull yellow; vertex tawny on the disk with narrow black lines converging toward the tips, a black border at base, and a narrow black line on the margin between vertex and front, within which is a lighter space; pronotum greenish on the disk and hinder part; scutellum tawny; elytra green, with a narrow border next to scutellum and the claval suture, blue; costa light yellow; apex yellowish with black dots at end of apical cells; margin above blackish bordered with red. Length: 5 mm.

Specimens from Bonda, Colombia, July, 1898, Carn. Mus. Acc. No. 1999 (H. H. Smith *coll.*).

These specimens agree quite perfectly with Fowler's description of his var. *proprior*, but would easily answer to Walker's original description. The red border of abdomen is entirely covered by the elytra when closed.

157. **Graphocephala lineola** sp. nov. Pl. XVI, figs. 71, 71a.

Head as wide as pronotum, subangulate in front; vertex somewhat flattened, scarcely as long at middle as between the eyes, obtusely angular with front; front tumid; clypeus elevated, narrowed to tip; cheeks narrow; pronotum one-half longer than vertex, hind border truncate. *Genitalia: female*, last ventral segment elongate, hind border narrow, rounding, subangulate; *male*, last ventral segment as long as preceding; plates narrow, contracted toward tip and with two delicate hook-like appendages at apex.

Pale olive; vertex with a minute black dot at apex, a broad orange-red border, the disk yellowish, with fine black lines extending into an angular point at the middle and on either side; pronotum light green, anterior border faintly inscribed with blackish, the borders bright orange-red; scutellum light green with fine blackish lines; elytra dark green with a narrow costal border of orange; beneath light yellowish or testaceous; abdomen above black, margined with yellowish. Length: female, 6 mm.; male, 5 mm.

Described from one female (type), three males (allotype and paratypes), Minca, Colombia, May, 1898, Carn. Mus. Acc. No. 1999 (H. H. Smith *coll.*).

158. **Graphocephala humeralis** sp. nov. Pl. XVI, figs. 64, 64a.

Head as wide as pronotum, obtusely angulate; disk slightly flattened; border obtusely angulate, more or less rounded to front; front tumid; clypeus narrowed to bluntly angulate tip; pronotum nearly twice as long as vertex. *Genitalia: female*, last ventral segment elongate, hind border slightly produced and rounded; *male*, last ventral segment slightly longer than preceding, subtruncate; plates nearly as wide as the last segment at base, narrowed and subconical toward tip; tips upturned and setose, reaching nearly to the tip of pygofer, which is densely setose.

Olive-green; the vertex with a broad orange-red margin, extending down upon base of front, no black dot at the tip; the disk light green with narrow black lines, but not extending into angles as in *G. lineola*; pronotum olive-green, the humeral angles with large conspicuous orange-red spots, sometimes extended as a narrow border to the eye; scutellum pale green with minute blackish lines and dots; elytra dark

olive-green; costa narrowly orange-red; beneath pale yellowish; abdomen blackish above, the lateral borders yellowish. Length: 6 mm.

Described from one female (type) and three males (allotype and paratypes), Minca, Colombia, May, June, and July, 1898, Carn. Mus. Acc. No. 1999 (H. H. Smith *coll.*).

159. **Graphocephala spinosa** sp. nov. Pl. XVI, figs. 68, 68a, 68b.

Head as wide as pronotum, rounded, subangulate at front; vertex slightly depressed; front tumid; clypeus elevated at base and on the middle, narrowed to tip; pronotum nearly twice as long as vertex; hind border truncate. *Genitalia: female*, last ventral segment twice as long as the preceding, the posterior border produced into a sharp spine at the middle; *male*, last ventral segment as long as the preceding, plates broad at base, nearly as wide as preceding segment, contracted beyond the middle, somewhat conical, acute, upturned and divergent at tip, nearly reaching the tip of the pygofer.

Above dark olive-green; vertex on the disk with fine lines, the anterior border broadly orange-red, margined behind with a black line and with a black dot at tip; front greenish with faint fuscous arcs; pronotum dark olive-green, anterior part paler with faint fuscous dots and lines, lateral border orange-red; scutellum green, lined and dotted with blackish; elytra uniformly dark olive-green with narrow costal margin of orange-red, extreme tips smoky subhyaline; beneath yellowish; legs testaceous; tips of tarsi dusky. Length: 6.5 mm.

Described from six specimens, four females (type and paratypes), two males (allotype and paratype). Three females and the two males are from Chapada, Brazil, May, November; one female is from Rio de Janeiro, August, Carn. Mus. Acc. No. 2966 (H. H. Smith *coll.*).

These specimens have much the same color-pattern as *G. humeralis*, but the orange border of the pronotum is of uniform width. The specimens are larger and the spinous hind border of the female furnishes a very distinctive character.

Genus KOLLA Distant.

Kolla DISTANT, Fauna Brit. Ind., Rhynchota IV, 1908, p. 223. (Orthotype *K. insignis* Distant *l. c.*)

160. **Kolla fasciata** (Walker).

Tettigonia fasciata WALKER, List Homopt. B. M., III, 1851, p. 780.

Tettigonia fuscolinella FOWLER, Biol. Cent.-Am., Homopt., II, 1900, p. 290, pl. XIX, fig. 25.

Head broad, wider than pronotum, short, rounded in front; vertex

slightly longer at middle than next the eye; front slightly tumid; clypeus contracted toward the tip; pronotum twice as long as vertex, side margins short, hind border convex. *Genitalia: female*, last ventral segment nearly twice as long as preceding; hind border produced, about one-fourth the length of the segment, bluntly angulate at middle; *male*, last ventral segment truncate, valve hidden, plates very short, triangular, tips acute and slightly divergent, reaching about one-third the length of the pygofer.

Olive-green or brownish; vertex at tip, a band between the eyes, a submarginal band at the base of pronotum and the veins of elytra, black; pronotum greenish olive or brownish, the anterior and posterior borders light yellow or whitish, with brownish suffusion at collar; abdomen more deeply tinged with reddish. Length: female, 5.5 mm.; male, 5 mm.

Bonda, Colombia, July, 1898, Carn. Mus. Acc. No. 1999 (H. H. Smith coll.).

This species ranges from the southern United States, through Mexico and Central America. I have collected it at Orizaba, V. C., Mexico; specimens are in hand from Guatemala, collected by J. S. Hine; and Fowler reports it from Mexico and Panama.

This species has been placed as a variety of *bifida*, Say but the head is distinctly shorter and more rounded in front; it lacks the two minute yellow dots at the apex of vertex, and further the two species do not appear to show any tendency to intergrade in Florida where both are common.

161. *Kolla geometrica* (Signoret).

Tettigonia geometrica SIGNORET, Ann. Soc. Ent. Fr. (3) II, 1854, p. 12, pl. 12, fig. 13.
Tettigonia psittacella FOWLER, Biol. Cent.-Am., Homopt., II, 1900, p. 290, pl. XIX, fig. 26.

Head wider than pronotum, angulate; vertex nearly twice as long at middle as next the eye; front tumid; clypeus broadly carinate; pronotum broadly rounded in front, truncate behind. *Genitalia: female*, last ventral segment twice as long as preceding, hind border produced to nearly twice the length at sides, distinctly angulate; *male*, last ventral segment truncate, valve very narrow or hidden, plates elongate, triangular, tips conical and slightly divergent, reaching half-way to tip of pygofer.

Dark green; vertex and front, black, the former with two dots at apex, a transverse band between the eyes, and the hind border yellow; pronotum dark olive-green; the anterior margin and posterior sub-margin, black; anterior sub-margin and posterior margin, yellow; scutellum with a transverse black band on the disk; elytra uniformly dark green without markings; tips of discal cells yellowish green and

the apical membrane smoky; beneath black; legs testaceous, somewhat infusate. Length: female, 4.5 mm.; male, 4 mm.

Specimens from São Paulo, Brazil, Aug. 26, 1908; Bahia; and Munez Freire, Brazil, July 17, 1908, Carn. Mus. Acc. No. 4135 (Hase-man *coll.*); also from Cacagualito, Colombia, Carn. Mus. Acc. No. 1999 (H. H. Smith *coll.*).

This species is common in the southern United States, and ranges through Mexico and Central America to southern Brazil. It favors moist locations, and, while sometimes very abundant, is probably of little economic importance, since it is not known to attack cultivated crops or plants of commercial value.

Genus HELOCHARA Fitch.

Helochara FITCH, Homop. N. Y. State Cab., 1851, p. 56. (Haplotype *Helochara communis* Fitch, *l. c.*)

This genus was established to include the single species *H. communis* Fitch. One of the characters is based on the disk of the male antennæ. Other species, which seem to be congeneric, do not possess this feature, but agree in other details, especially in the small scutellum, the projection of the front upon the vertex and the gibbous clypeus. The following species seem to be properly included in this genus.

162. *Helochara xanthophis* (Berg).

Tettigonia xanthophis BERG, Hemip. Argentina, 1879, p. 254.

Head wider than pronotum, subangulate in front, produced; vertex nearly twice as long at middle as next the eye; front tumid, borders striate, extended on front and occupying nearly one-half the space, but not reaching to the ocelli; pronotum broadly arched in front, rugose anteriorly, polished, obsoletely striate on the disk; lateral margins short; postero-lateral angles broadly rounded; hind border faintly sinuate; scutellum small, deeply depressed before the middle; elytra with the apical portion hyaline with nervures conspicuous. *Genitalia: female*, last ventral segment long, rather deeply notched on either side of a central, broad, angulate tooth; *male*, last ventral segment as long as preceding, the valve hidden, plates broad at base, narrowing abruptly before the middle and extended as slender acutely pointed tips to end of pygofer.

Yellow below; vertex greenish, except reflected striate part from front; pronotum polished, paler on the anterior border; scutellum yellowish-green; elytra densely pigmented with green to tip of clavus, then depigmented hyaline, the veins showing black, in some specimens the depigmentation extending over one-half of the apical part of the elytra; two black dots at apex of vertex, in some specimens obscure. Length: 5.5 mm.; width 2 mm.

Specimens referred to this species are from Chapada, Brazil, Carn. Mus. Acc. No. 2966 (H. H. Smith *coll.*); Jacaré, Mina Geraes, Brazil, Dec. 11, 1907 (Haseman *coll.*); Provincia del Sara, Bolivia, 450 m., one labelled Feb. 13, 1913 (Steinbach *coll.*).

The peculiar depigmentation, while perhaps not a specific character, is a pronounced feature of the species and present in all the specimens at hand.

163. *Helochara argentina* (Berg).

Tettigonia argentina BERG, Hemip. Argentina, 1879, p. 255.

Head wider than pronotum, distinctly angular; vertex acute at tip, more than twice as long at the middle as next the eye; front tumid, punctured, and striate; clypeus rugose; pronotum coarsely punctured, rounded before lateral borders, short; postero-lateral angles rounded; hind border angularly emarginate; scutellum rather small; elytral veins straight, inner vein of clavus obsolete toward tip. *Genitalia: female*, last ventral segment twice as long as preceding, sides parallel, hind border slightly produced; *male*, last ventral segment produced at the middle, obtusely angled, plates narrowed uniformly from base to acute tips, which reach to tip of pygofer.

Light yellowish-green; vertex lined with fuscous; front with brownish arcs; pronotum with dots and sinuate lines near the anterior border; elytra light green, the veins fuscous, fading toward the tip, black in the male, apex hyaline. Length: female, 5.5 mm.; male, 4.5 mm.

Two specimens, females from St. Isabel, Uruguay, Nov. 12, 1909, Carn. Mus. Acc. No. 3793 (Haseman *coll.*). A male specimen in my collection from Dr. M. S. Pennington represents the type locality.

DRAECULACEPHALA Ball.

Dræculacephala BALL, Proc. Ia. Acad. Sci., viii, 1901, p. 66. (Orthotype *Tettigonia mollipes* Say, Journ. Acad. Nat. Sc. Phila., VI, 1831, p. 312.)

164. *Dræculacephala mollipes* Say.

Tettigonia mollipes SAY, *l. c.*—Signoret, Ann. Soc. Ent. Fr. (3) II, 1854, p. 726, pl. 21, figs. 12, 13.—FOWLER, Biol. Cent.-Am., Homopt., II, 1900, p. 273, pl. XVIII, fig. 15.

Tettigonia innotata WALKER, List Homopt. B. M., pt. III, 1851, p. 770.

Tettigonia angulifera WALKER, *l. c.*, p. 771.

Tettigonia antica WALKER, *l. c.*, p. 771.

Tettigonia minor WALKER, *l. c.*, p. 772 (in part).

Tettigonia producta WALKER, *l. c.*, p. 772.

Tettigonia acuta WALKER, *l. c.*, p. 773.

Head acutely pointed; vertex as long on middle as width between the eyes; apex depressed; front flattened on the disk; clypeus elevated

on disk, contracted at tip; pronotum strongly arched in front, scarcely concave behind, minutely rugose or punctate. *Genitalia: female*, last ventral segment twice as long as preceding, distinctly produced at the middle; *male*, valve small, obtusely angular behind; plates broad at base, narrowing uniformly to acute upturned tips.

Grass-green; vertex, anterior border of pronotum, scutellum, and costa, yellow; outer part of costa and margin of apical cells, hyaline; face smoky; front and upper part of cheeks, smoky; a blackish line under the eyes, lower part of face and legs whitish; abdomen above, smoky; beneath, greenish; plates greenish-white. Length: female, 8 mm.; male, 6 mm.

A specimen of the male of this widely distributed species from Bonda, Colombia, Carn. Mus. Acc. No. 1999, June 19, (H. H. Smith coll.).

This specimen agrees very closely with specimens from the United States, New York, Iowa, etc., and I think that there can be no question as to the identity with Say's species. Fowler in the *Biologia* has included a number of Walker's descriptions of this species, and while there may be some doubt as to the validity of all, the writer agrees that *T. innotata*, described from Brazil, must probably be included here.

165. *Dræculacephala clypeata* sp. nov. Pl. XVI, figs. 73, 73a.

Head triangular, wider than pronotum; ocelli twice as far from each other as from eyes; vertex scarcely as long as width between the eyes; apex slightly less than right angle, depressed, rounded at tip; front full, flattened on the disk; clypeus very large, tumid at base, contracted at tip; loræ narrow; cheeks narrow; outer margin nearly straight; pronotum broadly rounded in front; lateral margins roughly carinate, surface minutely rugose, a callosity behind each eye, hind border slightly emarginate; elytra reticulate beyond tip of clavus. *Genitalia: female*, last ventral segment twice as long as preceding, produced on middle, obtusely angular, and faintly notched.

Grass-green; vertex, anterior border of pronotum, scutellum, costal border of elytra, and underside, light yellow; vertex, the margins of anterior depressions, and the sutures, lined with black and the disk sprinkled with black dots; front greenish yellow, mottled with fuscous; clypeus with fuscous patches on the disk at base; hind wings, abdomen above, and basal segments smoky. Length: 8 mm.

Described from one specimen, female (type) Munez Freire, Brazil, June 17, 1908 (Haseman coll.).

Genus PAGARONIA Ball.

Pagaronia BALL, Canadian Entomologist, XXXIV, 1902, p. 19. (Haplotype *Pagaronia 13-punctata* Ball, l. c.)

166. *Pagaronia miniaticeps* (Fowler).

Telligonia miniaticeps FOWLER, Biol. Cent.-Am., Homopt., II, 1900, p. 285, pl. XIX, fig. 14.

Head slightly wider than pronotum; vertex produced, rounded to front; front tumid; clypeus long; loræ and cheeks narrow; pronotum longer than vertex; hind border concave. *Genitalia: female*, last ventral segment elongate, narrowed behind, apex rounded, strongly carinate; *male*, valve covered; plates narrow, contracted, and spine-like.

Orange or orange-red; ocellar dots, a central spot at apex, and the eyes, black; disk of pronotum and costa and faint tinge on some of the veins, light olive; elytra dark purple or bluish; abdomen above red. Length: 5.5 to 6 mm.

This handsome species was described from various points in Mexico, Guatemala, Nicaragua, and Panama, and the author has recorded it from points in Guatemala. Specimens in the Carnegie Museum are from Minca, Colombia, Acc. No. 1999, May, 1898 (H. H. Smith *coll.*).

167. *Pagaronia mollicella* (Fowler).

Telligonia mollicella FOWLER, Biol. Cent.-Am., Homopt., II, 1900, p. 289, pl. XIX, fig. 24.

Resembling *P. tripunctata*, but with the central dot of vertex larger; apical dots small, surrounded by a white circle; head wider than pronotum; vertex subangularly produced; front convex, large; clypeus small; loræ narrow; cheeks narrow; pronotum distinctly emarginate behind; venation distinct, simple.

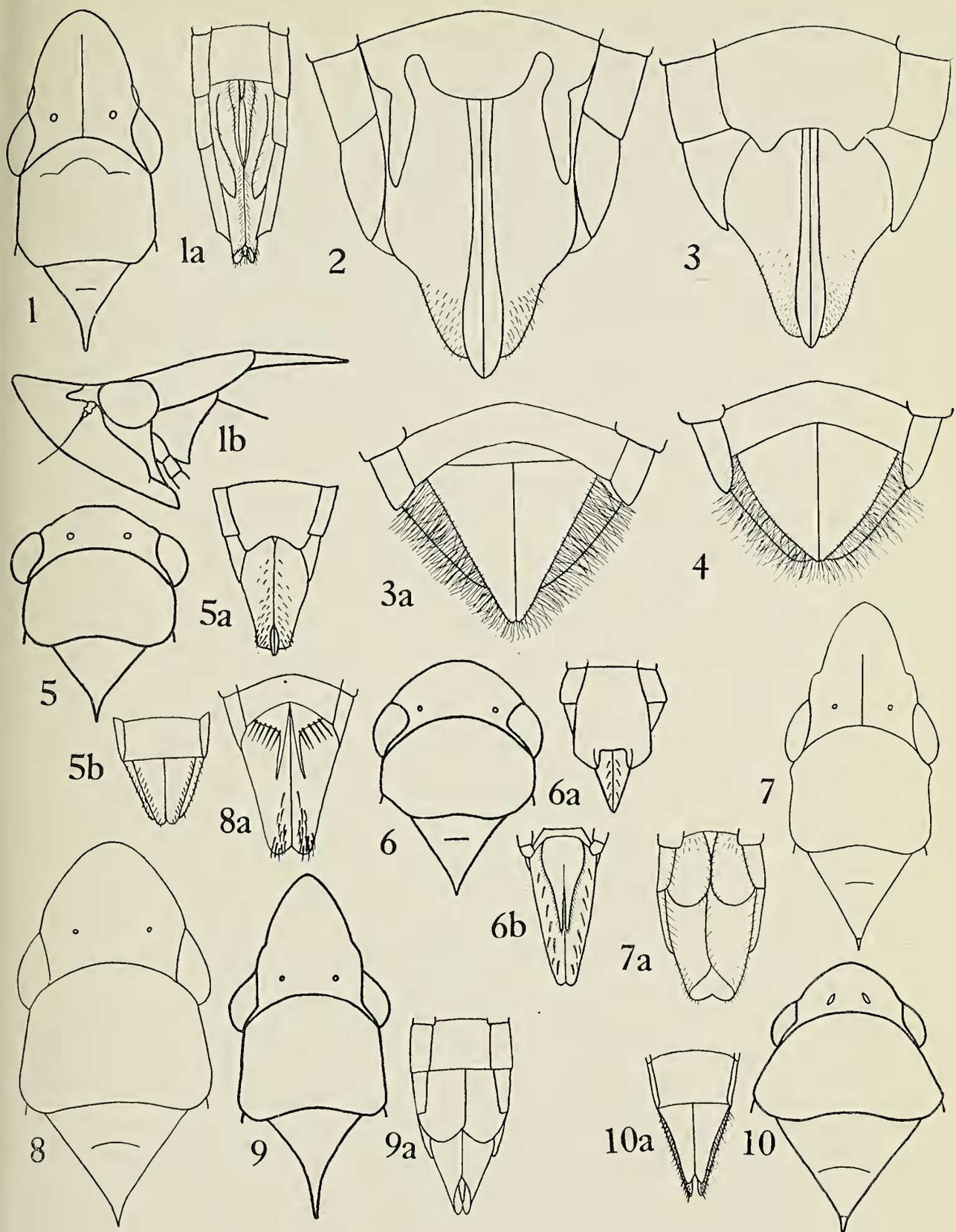
Soiled whitish; pronotum, scutellum, and elytra milky whitish, pronotum with two obscure bands and the elytral veins light fuscous. Length: 5 to 6 mm.

This species was described from Mexico, Orizaba, Atoyac, Vera Cruz, and Teapa.

Specimens from Provincia del Sara, Bolivia, Carn. Mus. Acc. No. 5064, December, 1912 (Steinbach *coll.*) and Taperina, Brazil, Carn. Mus. Acc. No. 2966 (H. H. Smith *coll.*).

EXPLANATION OF PLATE XI.

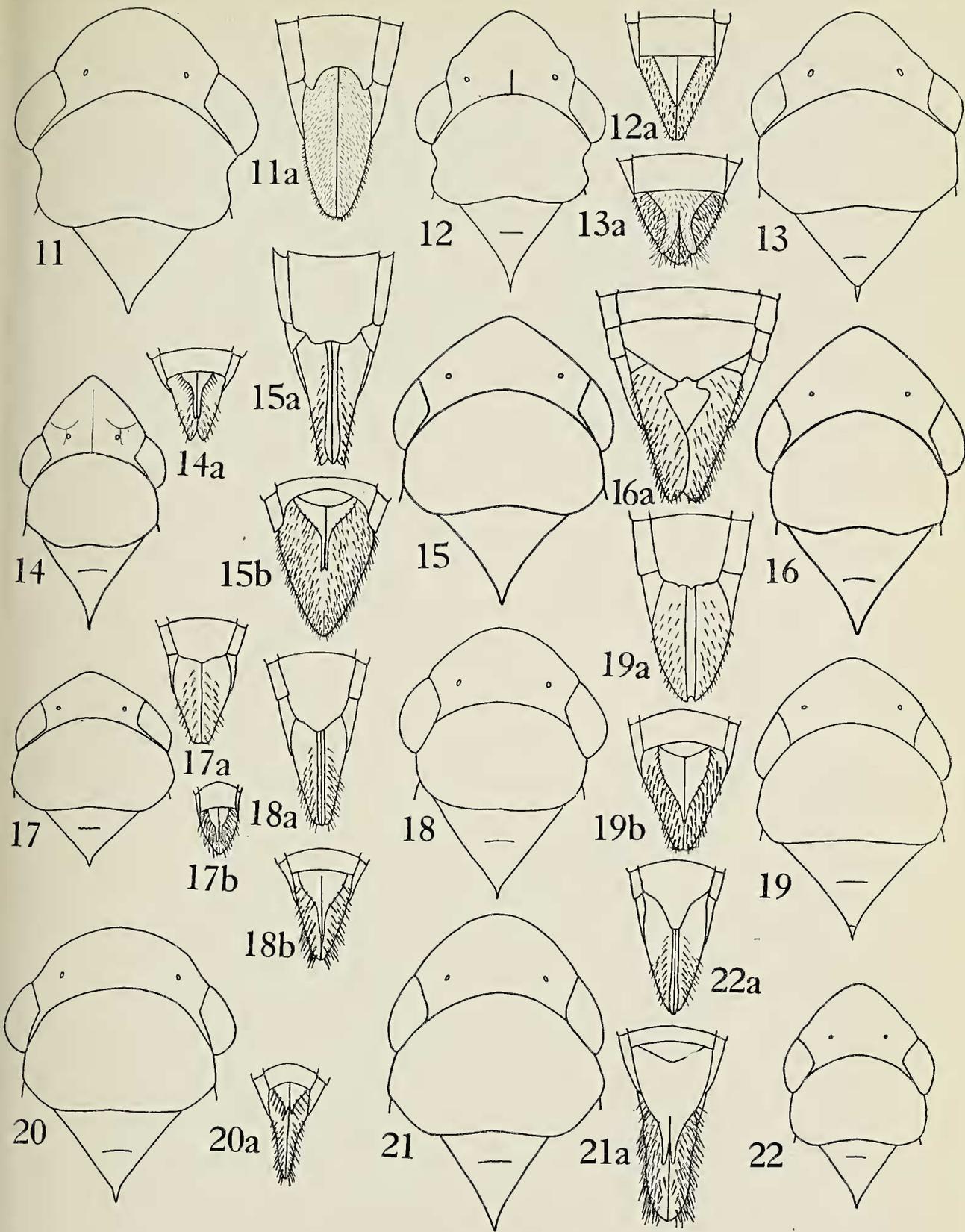
- FIG. 1. *Aulacizes delicata* Osborn, sp. nov.; 1a, genitalia; 1b, side view of head and pronotum.
- FIG. 2. *Aulacizes sculptilis* Osborn, sp. nov.; female segment.
- FIG. 3. *Aulacizes dufouri* Signoret; 3a, male genitalia.
- FIG. 4. *Aulacizes amblardi* Signoret; 4a, male genitalia.
- FIG. 5. *Amblydisca cinerea* Osborn, sp. nov.; 5a, female genitalia; 5b, male genitalia.
- FIG. 6. *Cicadella pendulosa* Osborn, sp. nov.; 6a, female genitalia; 6b, male genitalia.
- FIG. 7. *Aulacizes olivacea* Osborn, sp. nov.; 7a, male genitalia.
- FIG. 8. *Aulacizes marginula* Osborn, sp. nov.; 8a, male genitalia.
- FIG. 9. *Aulacizes gracilis* Osborn, sp. nov.; 9a, male genitalia.
- FIG. 10. *Aulacizes splendidula* Osborn, sp. nov.; 10a, male genitalia.



Aulacizes, Amblydisca, Cicadella.

EXPLANATION OF PLATE XII.

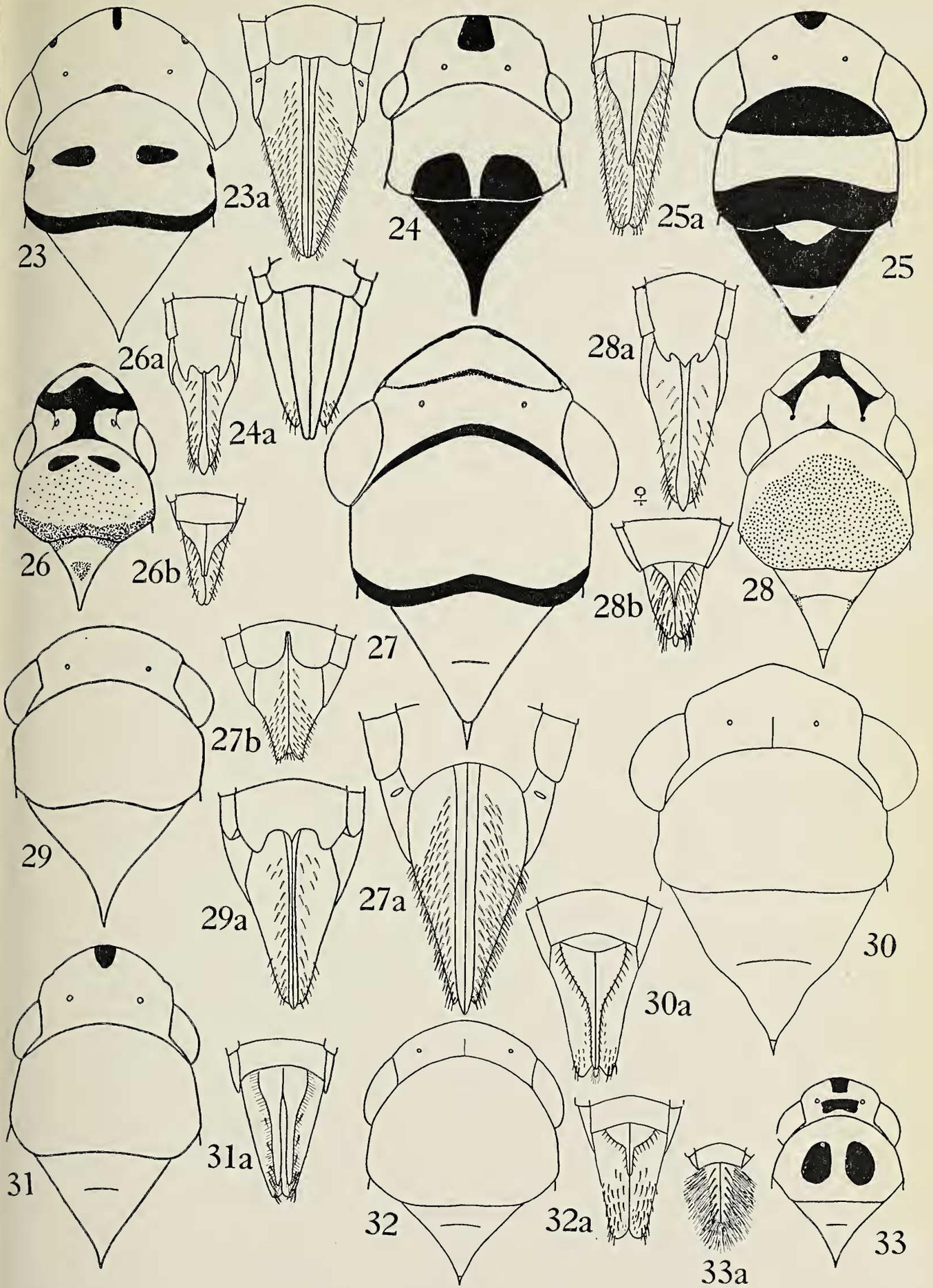
- FIG. 11. *Oncometopia ocellata* Osborn, sp. nov.; 11a, female genitalia.
FIG. 12. *Oncometopia marginulla* Osborn, sp. nov.; 12a, male genitalia.
FIG. 13. *Oncometopia minor* Osborn, sp. nov.; 13a, male genitalia.
FIG. 14. *Oncometopia rosipennis* Osborn, sp. nov.; 14a, male genitalia.
FIG. 15. *Cicadella discoidula* Osborn, sp. nov.; 15a, female genitalia; 15b, male genitalia.
FIG. 16. *Cicadella notulatula* Osborn, sp. nov.; 16a, female genitalia; 16b, male genitalia.
FIG. 17. *Cicadella callosa* Osborn, sp. nov.; 17a, female genitalia; 17b, male genitalia.
FIG. 18. *Cicadella lituriceps* Osborn, sp. nov.; 18a, female genitalia; 18b, male genitalia.
FIG. 19. *Cicadella nebulosa* Signoret, 19a, female genitalia; 19b, male genitalia.
FIG. 20. *Cicadella tinctorula* Osborn, sp. nov.; 20a, male genitalia.
FIG. 21. *Cicadella interruptula* Osborn, sp. nov.; 21a, male genitalia.
FIG. 22. *Cicadella dorsifascia* Osborn, sp. nov.; 22a, female genitalia.



Oncometopia, Cicadella.

EXPLANATION OF PLATE XIII.

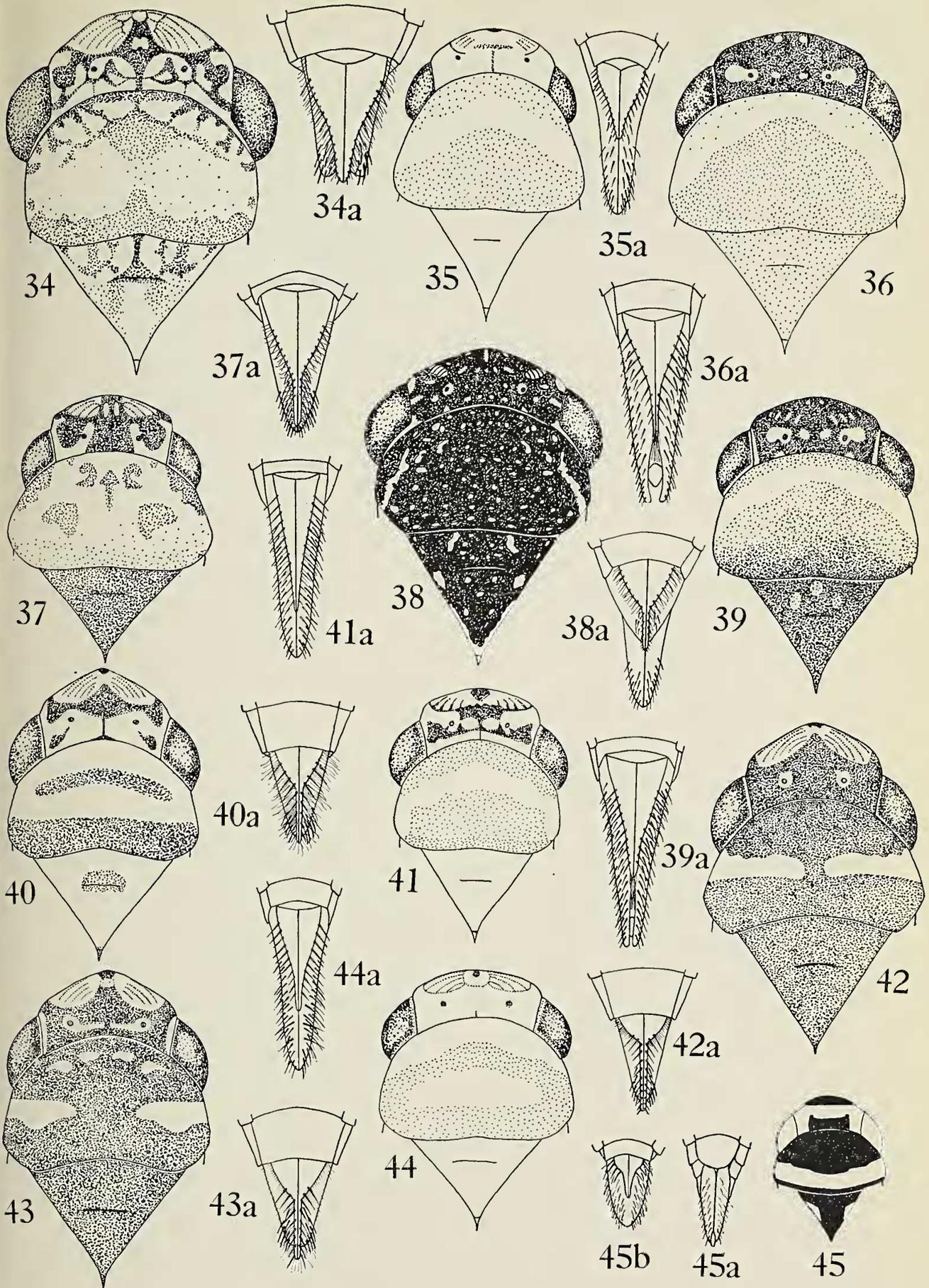
- FIG. 23. *Cicadella hyalinatula* Osborn, sp. nov.; 23a, female genitalia.
FIG. 24. *Cicadella longicornis* Osborn, sp. nov.; 24a, female genitalia.
FIG. 25. *Cicadella terminalis* Osborn, sp. nov.; 25a, male genitalia.
FIG. 26. *Cicadella signatula* Osborn, sp. nov.; 26a, female genitalia; 26b, male genitalia.
FIG. 27. *Cicadella subhyalina* Osborn, sp. nov.; 27a, female genitalia; 27b, male genitalia.
FIG. 28. *Cicadella conjunctula* Osborn, sp. nov.; 28a, female genitalia; 28b, male genitalia.
FIG. 29. *Cicadella cinctosula* Osborn, sp. nov.; 29a, female genitalia.
FIG. 30. *Cicadella nubacula* Osborn, sp. nov.; 30a, male genitalia.
FIG. 31. *Cicadella corallina* Osborn, sp. nov.; 31a, male genitalia.
FIG. 32. *Cicadella limbatula* Guerin; 32a, male genitalia.
FIG. 33. *Cicadella brunneatula* Osborn, sp. nov.; 33a, male genitalia.



Cicadella.

EXPLANATION OF PLATE XIV.

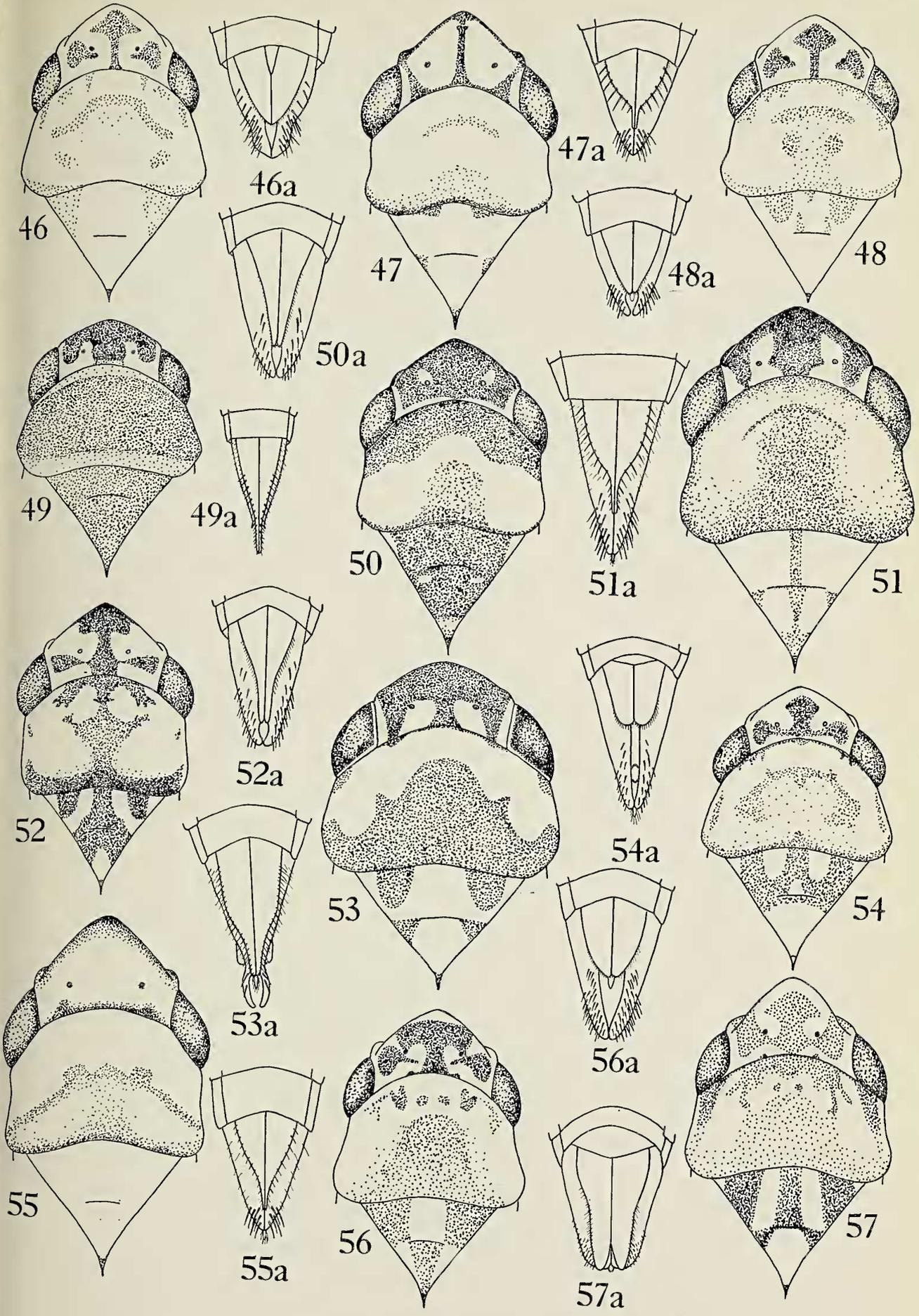
- FIG. 34. *Cicadella inscriptula* Osborn, sp. nov.; 34a, male genitalia.
FIG. 35. *Cicadella facetula* Jacobi; 35a, male genitalia.
FIG. 36. *Cicadella prætextatula* Jacobi; 36a, male genitalia.
FIG. 37. *Cicadella scutellatula* Osborn, sp. nov.; 37a, male genitalia.
FIG. 38. *Cicadella nigricula* Osborn, sp. nov.; 38a, male genitalia.
FIG. 39. *Cicadella occipitula* Osborn, sp. nov.; 39a, male genitalia.
FIG. 40. *Cicadella tigrinula* Osborn, sp. nov.; 40a, male genitalia.
FIG. 41. *Cicadella ornatula*, Osborn, sp. nov.; 41a, male genitalia.
FIG. 42. *Cicadella limboclavula* Osborn, sp. nov.; 42a, male genitalia.
FIG. 43. *Cicadella transversula* Osborn, sp. nov.; 43a, male genitalia.
FIG. 44. *Cicadella cyclopula* Jacobi; 44a, male genitalia.
FIG. 45. *Cicadella corrugipennis* Osborn, sp. nov.; 45a, male genitalia.



Cicadella.

EXPLANATION OF PLATE XV.

- FIG. 46. *Graphocephala separata* Osborn, sp. nov.; 46a, male genitalia.
FIG. 47. *Graphocephala contractula* Osborn, sp. nov.; 47a, male genitalia.
FIG. 48. *Graphocephala affinula* Osborn, sp. nov.; 48a, male genitalia.
FIG. 49. *Cicadella semicinctula* Osborn, sp. nov.; 49a, male genitalia.
FIG. 50. *Graphocephala pruriginosula* Jacobi; 50a, male genitalia.
FIG. 51. *Graphocephala attenuata* Osborn, sp. nov.; 51a, male genitalia.
FIG. 52. *Graphocephala cardinula* Osborn, sp. nov.; 52a, male genitalia.
FIG. 53. *Cicadella curvatula* Osborn, sp. nov.; 53a, male genitalia.
FIG. 54. *Graphocephala personatula* Jacobi; 54a, male genitalia.
FIG. 55. *Graphocephala simillima* Osborn, sp. nov.; 55a, male genitalia.
FIG. 56. *Graphocephala involuta* Osborn, sp. nov.; 56a, male genitalia.
FIG. 57. *Graphocephala longula* Osborn, sp. nov.; 57a, male genitalia.

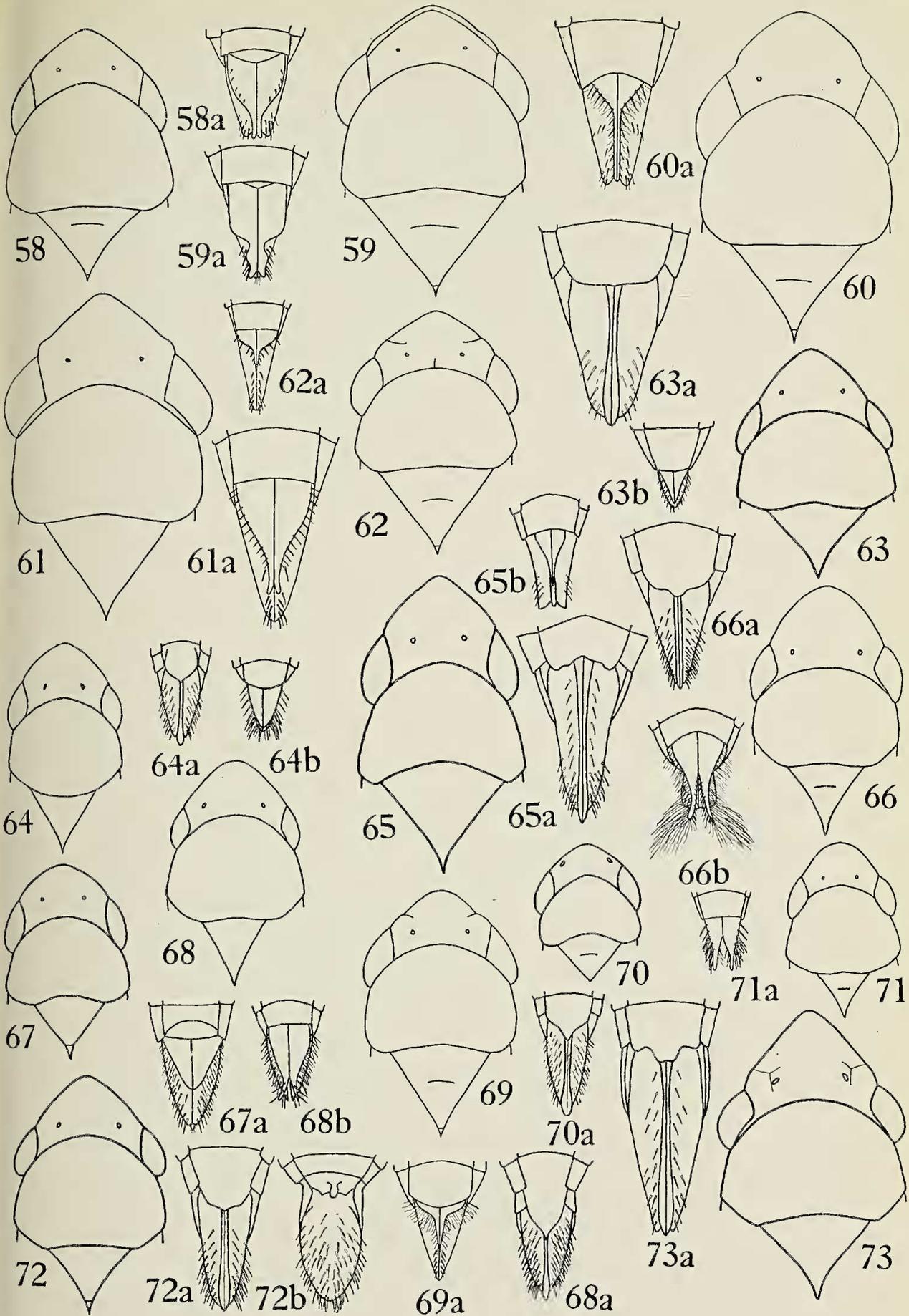


Graphocephala, Cicadella.

EXPLANATION OF PLATE XVI.

- FIG. 58. *Graphocephala ludicula* Osborn, sp. nov. (Breddin?); 58a, male genitalia.
FIG. 59. *Cicadella olivatula* Osborn, sp. nov. (Breddin?); 59a, male genitalia.
FIG. 60. *Cicadella ventralis* Signoret; 60a, male genitalia.
FIG. 61. *Graphocephala atramentatula* Breddin; 61a, male genitalia.
FIG. 62. *Graphocephala brevisula* Osborn, sp. nov.; 62a, male genitalia.
FIG. 63. *Cicadella cuneatula* Osborn, sp. nov.; 63a, male genitalia.
FIG. 64. *Graphocephala humeralis* Osborn, sp. nov.; 64a, male genitalia.
FIG. 65. *Diedrocephala albula* Osborn, sp. nov.; 65a, female genitalia; 65b, male genitalia.
FIG. 66. *Cicadella hectica* Walker; 66a, female genitalia; 66b, male genitalia.
FIG. 67. *Cicadella apicula* Osborn, sp. nov.; 67a, male genitalia.
FIG. 68. *Graphocephala spinosa* Osborn, sp. nov.; 68a, female genitalia; 68b, male genitalia.
FIG. 69. *Graphocephala plebejula* Osborn sp. nov. (Breddin?) 69a, male genitalia.
FIG. 70. *Cicadella clitellaria* Osborn, sp. nov.; 70a, female genitalia.
FIG. 71. *Graphocephala lineola* Osborn, sp. nov.; 71a, male genitalia.
FIG. 72. *Graphocephala submarginalis* Osborn, sp. nov.; 72a, female genitalia; 72b, male genitalia.
FIG. 73. *Dræculacephala clypeata* Osborn, sp. nov.; 73a, female genitalia.

(NOTE:—Nos. 58 and 69 have been described in this paper by Osborn from material bearing the manuscript names above given, followed by the word "Breddin." A search, made by Dr. Osborn and repeated by Mr. Hugo Kahl and the writer, has failed to reveal that Breddin in any paper published by him, to which we have access or reference, employed these names; and in the judgment of the Editor of the Annals these species should be credited to Osborn as new, although we allow the text to stand as received from the author. W. J. HOLLAND.)



Graphocephala, Diedrocephala, Dræculacephala, Cicadella.